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1931

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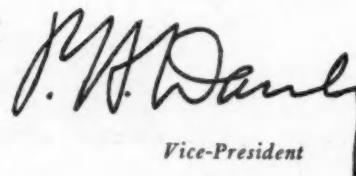
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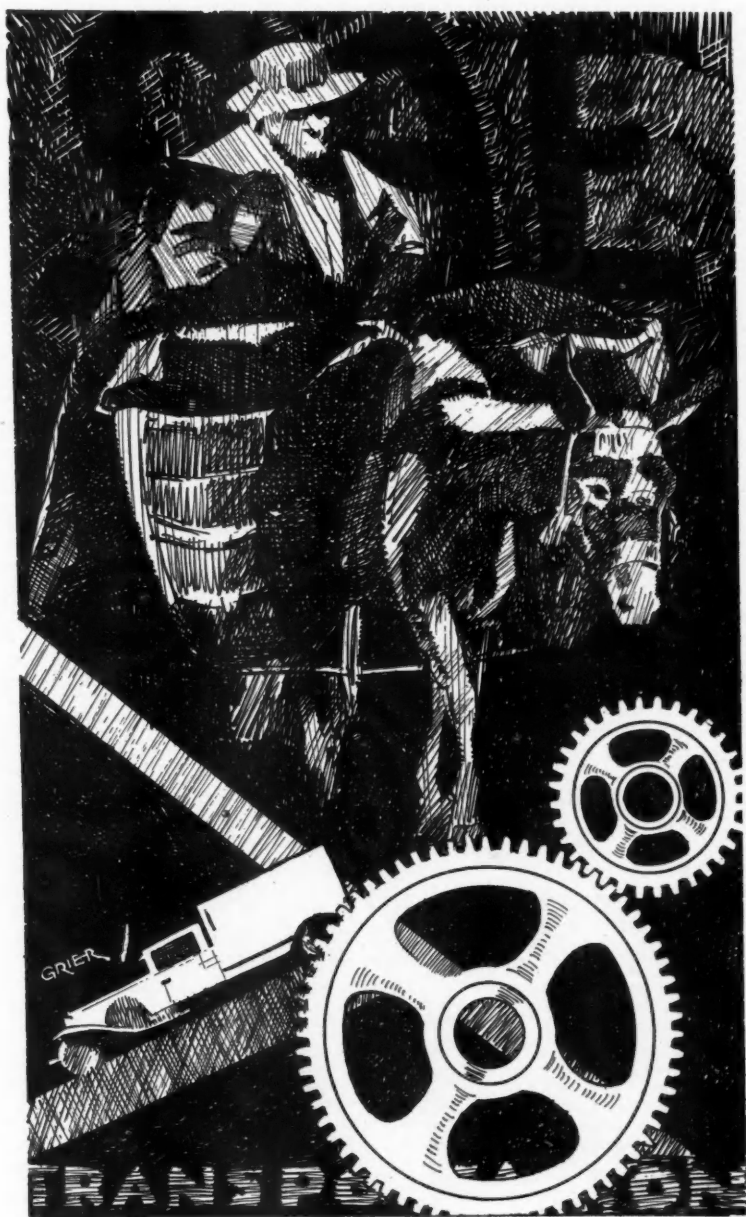
NICKEL-CHROMIUM STEELS

November 1, 1930

Automotive Industries

Army to Buy Motor Equipment Soon, S. A. E. Meeting is Told

by
James W. Cottrell



AN outline of plans of the U. S. Army, Quartermaster Corps, to build up a new fleet of motor vehicles, given by Lieut.-Col. Brainerd Taylor, Q.M.C., during the closing session of the Annual Transportation Meeting of the S.A.E., held in Pittsburgh, Oct. 22, 23 and 24, was in contrast with other papers on the program which were devoted largely to operation and maintenance of motor vehicles, particularly buses. Questions of design were brought up in three other addresses: engine cooling, tractive ability and dashboard instruments.

The U. S. Army, one of the largest fleet owners in the country, cannot postpone much longer the purchase of new motor equipment to replace World War type vehicles still in use. In fact the Army may be in the market in the near future, according to Brigadier-General F. H. Pope, Q.M.C., chief of transportation, in a written discussion of Lieut.-Col. Taylor's paper.

Based upon experience in the World War the Quartermaster Corps has evolved a system of unit repair and replacement for motor vehicles. This system will not only simplify maintenance of vehicles and supply of parts in the combat zone of a war but make it possible to develop vehicles needed from fighting forces largely from standard unit assemblies and sub-assemblies, in the opinion expressed by Lieut.-Col. Taylor.

Although motor transport requirements

Brig. Gen. F. H. Hope

Q.M.C., Chief of
Transportation

Said—

The Army may be in the market for more motor equipment in the near future.

for military service and peace time commerce are not alike, the vehicles needed for fighting forces may be standardized by interchanging standard commercial units in each of a group of vehicles. Upon these chassis bodies and/or special equipment suited to needs of the various branches of the Army are mounted, thus providing a wide range of motor equipment for the using branches without undue complication.

Extent of this proposed unit exchange is indicated in the accompanying box. The first line in each group represents a *type* of vehicle in standard production. Lower lines show types of vehicles suited to Army requirements which may be constructed by use of other assemblies or sub-assemblies, in many cases interchangeable with other units in commercial vehicles.

During the discussion of the paper several members suggested that the society cooperate to the fullest extent with the Army in the solution of the problem of standardization and interchangeability. It was indicated that the first step would be a study of the Army's requirements.

Provision for tachometer drive should be incorporated in design of truck and bus engines and a standard should be established by which dashboard instruments may be judged, tested and rated were conclusions which crystallized during the discussion of a paper on vehicle performance indicating and recording devices delivered by Carl W. Stocks, editor of *Bus Transportation*. Tachometer drives may be used to operate instruments indicating miles per hour of vehicle in high gear or engine r.p.m. The latter figure is important on vehicles operating with transmission gears other than high for extended periods, as in hill climbing.

Dashboard instruments were subjected to much constructive criticism during a discussion which prolonged the meeting beyond the allotted time. Aircraft instruments were held up as examples of devices rated on accuracy, performance and durability. Merrill C.

Horine, Mack trucks, suggested that bus and truck operators should have warning that something is amiss rather than readings on scales, the basis of which may be different on different vehicles.

The meeting passed a motion that a committee be appointed to find out the actual requirements of fleet owners and vehicle operators for indicating and recording instruments.

Adrian Hughes, Jr., read a paper on "Taking Advantage of Latent Heat of Cooling Water" in which he described the Foutz system of engine cooling. Referring to the diagram of the system (Fig 1 on page 653), when starting up, water is forced through the engine jacket and through radiator inlet 20 to the radiator upper tank 1. From there it descends through water legs 22 on opposite sides of condenser 21 constituted by the central section of the radiator, into radiator lower tank 2 and through suction connections 3 and 5 and venturi tube 4 to pump 6.

Suction in nozzle 15 withdraws air from condenser 21 and the space above the water level in radiator upper tank 1. Air entering the condenser through inlet 8 passes through to condenser lower tank 10 and out through connections 11 and 12 to ejector nozzle 15, through which it escapes. The mixture of water and air now passes through pump 6, where an emulsion is formed. This emulsion has a lower specific heat than water, and it is claimed that, as a result, heat is abstracted from the cylinder walls during this warming-up period at a lower rate than with the ordinary cooling system, and the engine therefore warms up more rapidly.

As the engine warms up, the air is expelled from the system, and if the temperature-control valve is set for 225 deg. Fahr., the aqueous vapor pressure will be 4.3 lb. p. sq. in. With air in the system this pressure would be obtained before the temperature reached 212 deg., and valve 16 would then open and the contained air would be ejected from the system. During this

Grouping of Military Motor Equipment

Interchangeability of Standard Truck Unit Assemblies is Contemplated Within Each Group

Group I Units	Group II Units	Group III Units	Group IV Units	Group V Units
Chassis	Chassis	Chassis	Chassis	Chassis
1-Ton, 4-w., 2-w-d	2-Ton, 4-w., 2-w-d	3-Ton, 4-w., 2-w-d	5-Ton, 4-w., 2-w-d	7½-Ton, 4-w., 2-w-d
1¼-Ton, 4-w., 4-w-d	2-Ton, 4-w., 4-w-d	3-Ton, 4-w., 4-w-d	5-Ton, 4-w., 4-w-d	7½-Ton, 4-w., 4-w-d
	2½-Ton, 6-w., 4-w-d	4-Ton, 6-w., 4-w-d	5-6-Ton, 6-w., 4-w-d	8-Ton, 6-w., 4-w-d
	3-Ton, 6-w., 6-w-d*	5-Ton, 6-w., 6-w-d*	7½-Ton, 6-w., 6-w-d*	8-10-Ton, 6-w., 6-w-d
	*Use Group III Engine	*Use Group IV Engine	*Use Group V Engine	

4-w., 2-w-d, etc., refers to 4-wheel, 2-wheel-drive.

NOTE: These allocations are tentative. However, if a heavier or lighter chassis than is indicated is desired, it can be provided from the next higher or lower Unit Group.

Motor Transport Standardization Chart, showing plan of development of military truck chassis through standardization of unit assemblies with interchangeability of units in any one Group, to simplify automotive repair and supply in the Theatre of Military Operations.



Adrian Hughes, Jr., superintendent of transportation of the United Railways & Electric Co., Baltimore + + + + +

warming-up period the condenser abstracts heat only from the contained air.

At the end of the warming-up period there is no air in the space above the water in the radiator upper tank 1 and in condenser 21. As the temperature of the circulating water increases more and more vapor is drawn into condenser 21 and returned as condensate through venturi nozzle 15, there mixing with the water from the radiator water legs 22 and then flowing on to pump 6. Condensation of the steam formed limits the pressure attained. A check valve 13 prevents water from entering the condenser when the engine is stopped.

It is claimed that steam pressure formed in the radiator upper tank forces the water to the pump and that the rate of circulation, therefore, increases and decreases with the pressure in the system. A vacuum of from 2 to 20 in. of mercury column is produced in the condenser by the ejector action on nozzle 15.

Among the advantages claimed for this system are that it results in much more rapid warming-up of the engine (about half the time at three-fourths full power), increases engine horsepower, decreases fuel consumption, makes possible a more economical use of alcohol in the cooling water in cold weather, and lessens danger from freeze-ups in eliminating alcohol loss, reduces scale formation on jacket walls and improves engine lubrication by reducing crankcase dilution. The system, of course, is normally completely closed to the atmosphere.

Mr. Hughes, who presented the paper, is superintendent of bus transportation of United Railways & Electric Co. of Baltimore, and he stated that the system was first installed on a 25-passenger White bus in February, 1926, that it is now in use on 11 buses in

Baltimore and 15 in Washington, and that a total mileage of over 3,000,000 has been covered with it to date. The system will be applied to all buses in the fleet eventually. Temperatures higher than those ordinarily employed may be used with the system but solder used in ordinary radiators is not suited to this service, said Mr. Hughes. A radiator adapted to steam at temperatures higher than 212 deg. is now being developed.

Austin M. Wolf, consulting engineer of Newark, N. J., talked on "Practical Methods for Determining and Comparing Tractive Ability." He quoted the formula for the tractive factor, viz.:

$$TF = \frac{t \times R \times e}{r \times W}$$

where t is the engine torque in lb.-in.; R , the axle ratio; e , the overall efficiency of the drive in direct gear (assumed to be 85 per cent); r , the rolling radius of the tire in inches, and W , the gross weight of chassis, body and load, in lb. This formula applies to performance in direct drive. For indirect gears the tractive factor becomes

$$TF = \frac{t \times R \times R_1 \times e_1}{r \times W}$$

where R_1 is the reduction ratio in the transmission and e_1 the mechanical efficiency of the entire drive in indirect gear, which is assumed to be 75 per cent.

The formula, it will be noted, is based upon engine torque and not horsepower. As a result it does not
(Turn to page 653, please)



Austin M. Wolf, consulting engineer of Newark, N. J. + +

Swinging Axle Type of Independent Variation in Tread

By
P. M. Heldt

In a number of the more recent designs, the driving force is taken on some form of radius rod

NON-RIGID (swinging or oscillating) driving axles have been used to a considerable extent in Germany, Austria and Czechoslovakia. The axle housing, instead of being one rigid structure, is made in three parts, viz.: the center housing, which is supported on the chassis frame, and two axle tubes which are adapted to oscillate around a horizontal or nearly horizontal axis, that of the driving pinion shaft or driveshaft. The axle shafts, of course, must swing in the vertical plane with the halves of the axle housing. Theoretically it would be possible to make use of the ordinary differential gear and provide each side gear of same with a short shaft connecting to its axle shaft by a universal joint. However, since the entire wheel torque would have to be transmitted through these joints, they would have to be made of considerable size, and their inclosure in the center housing would render that housing rather bulky. It is therefore more customary to place the differential gear on the driving shaft and to provide a separate bevel gear drive from each differential side gear to the corresponding axle shaft. While the two pairs of bevel gears must have the same ratio, the pitch diameters of the two driven gears must be made different, to avoid interference. The arrangement of a differential on the driving shaft, but without swinging axles, is shown in Fig. 1.

Fig. 2 represents the oscillating axle of the Rumpler front-drive passenger car, in which

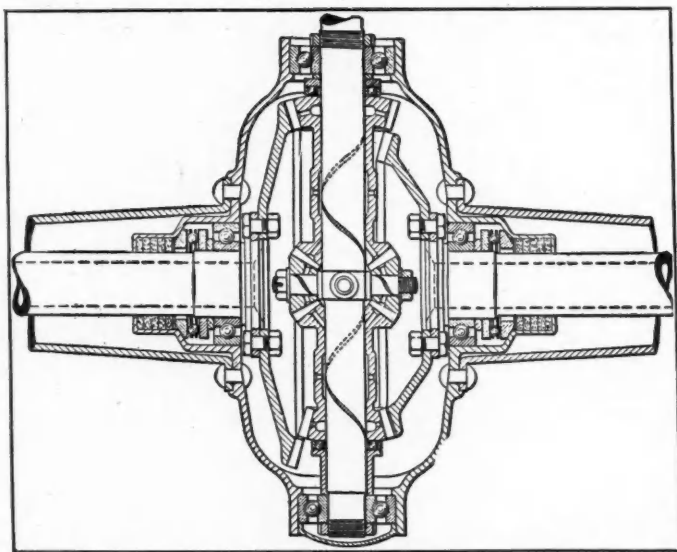
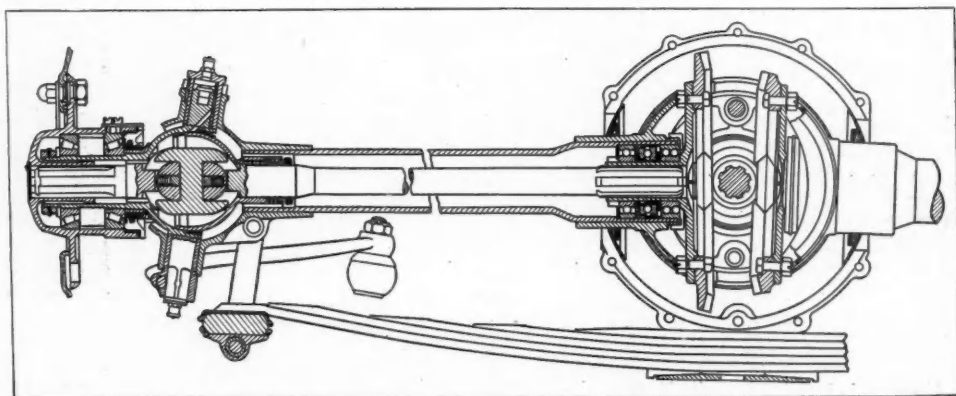


Fig. 1 (above) — Differential gear arranged on driving shaft, with final drive by two pairs of different-sized bevel gears + + + + +

Fig. 2 (right) — Rumpler oscillating axle for front-drive car



Springing Causes

This is the fourth of a series of articles by P. M. Heldt on "Independent Springing" to appear in *Automotive Industries*. The fifth will appear in a subsequent issue + + + + +

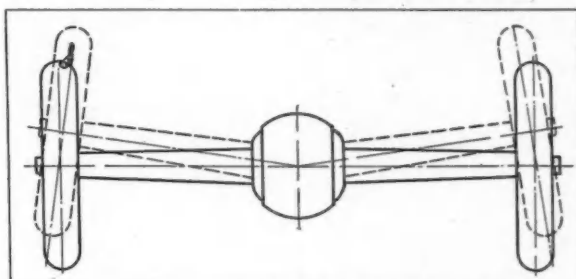


Fig. 3—Showing effect of spring action on wheel tread with swinging axles

the differential gear is located on the driving shaft and the power is transmitted to the axle shafts through two pairs of bevel gears of unequal size but of the same ratio. Rumberg, by the way, was one of the first (if not the first) to propose oscillating driving axles. The design here shown was evolved before the time when front-wheel brakes became common, and no provisions for such brakes are made. At their inner ends the axle tubes carry fittings with guide shells in the form of cylindrical segments. These shells are located between inner and outer surfaces of corresponding shape, on which is taken the reaction due to the moment of the traction force of the wheels. Suspension of the front end of the chassis is on a transverse half-elliptic spring, which type is favored by those using oscillating axles because the major portion of its weight is sprung.

An undesirable feature of the oscillating axle arrangement is the change in the wheel tread with spring action. We may consider the distance between the center points of ground contact when the two halves of the axle are in line with each other as the normal tread. Then, if the chassis springs are compressed further, so that the center point of the axle drops below the level of its ends, the wheels will spread apart at the bottom and the tread will be increased. For instance, with a tread of 56 in. and 30-in. wheels, an additional deflection of the springs of 1 in. (causing the center of the axle to drop 1 in. below the level of the ends) will result in an

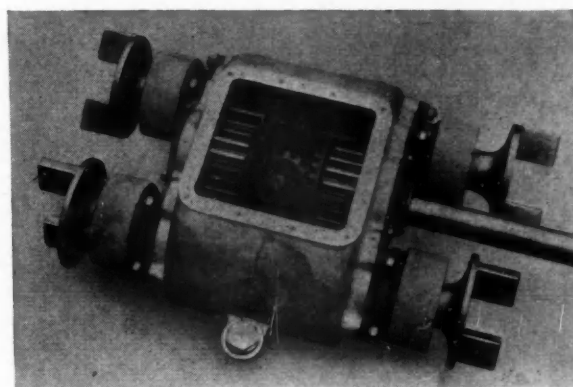


Fig. 4 (above)—Differential and distributing gears of Duerkopp six-wheeled truck + +



Fig. 5 (left)—One of the swinging axles of the Duerkopp truck, showing the trunnions around which it swings

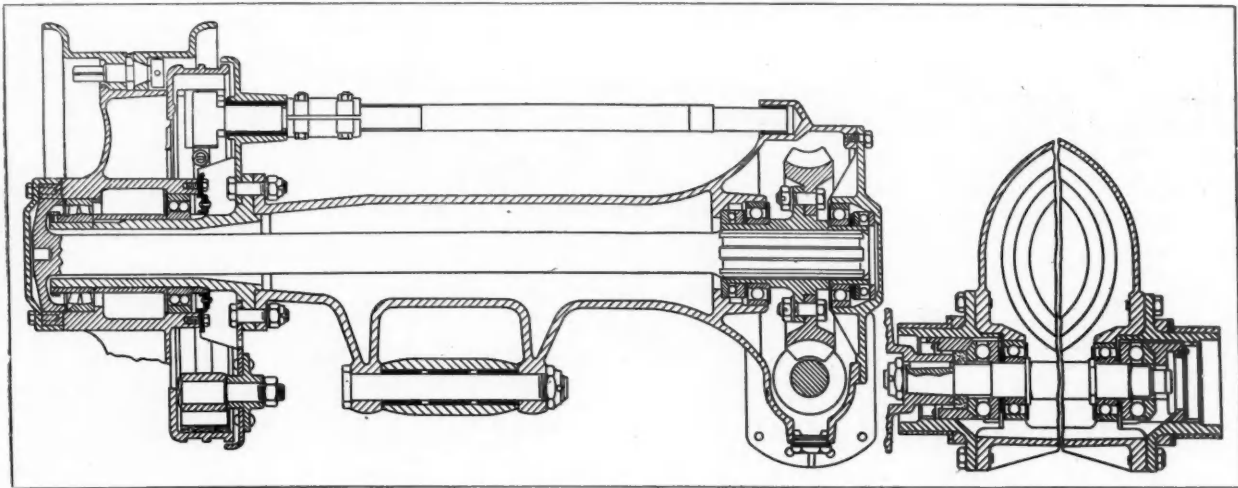


Fig. 6—Sectional views of one of the four driving half-axes of Duerkopp six-wheeled truck + + +

increase in tread to 57.02 in.; of 2 in., in an increase to 57.96 in.; of 3 in., to 58.82 in.; of 4 in., to 59.60 in., and of 5 in., to 60.30 in. Moreover, if during the rebound the center of the axle should be carried higher than to the level for which the two axle shafts are in line, the wheels will draw together at the bottom and the tread will be reduced. If the normal tread is designated by $2t$ and the wheel diameter by $2r$, then, if the frame drops (owing to spring action) to a level which is lower by a than that for which the two axle shafts are in line, the new tread T is given by the equation

$$T = 2 \sqrt{t^2 + ar - a^2}$$

The effect of spring action on the tread is clearly shown in Fig. 3.

The variation in the tread would be less if the axis of oscillation of the axle halves were closer to the ground, and the Austrian Daimler Co. has patented an arrangement whereby in a rear axle with under-mounted worm drive the axle halves swing around the

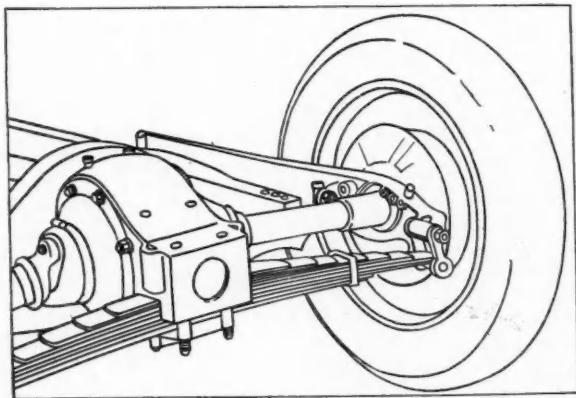


Fig. 7—Radius rod extended to rear of axle to form bracket for cross spring (Steyr) + + + + +

axis of the worm. The same plan is followed in the German Duerkopp six-wheeled truck which was exhibited at the Berlin show of 1929 but was never placed in production. In the drive of this truck, of which a number of illustrations are shown herewith (Figs. 4, 5 and 6), a propeller shaft running aft at the longitudinal center of the chassis carries a differential gear, and from the side gears of the latter the power is transmitted by spur pinions to two shafts running parallel with the propeller shaft in the same horizontal plane. Each of these shafts has a positive coupling at each end, and through these four couplings connections are made to four worm shafts. The worm, worm wheel and driveshaft are inclosed in a single-piece housing supported on trunnions in plain bearings on the chassis frame concentric with the worm. There is an opening provided with a cover plate at the inner end of the housing, through which the worm wheel is introduced. A yoke to which one end of the inverted half-elliptic spring is pivoted is cast integral with the axle tube on the under side. The springs are of the inverted half-elliptic type and have a pivotal connection with the chassis frame at their center, hence each of the four half-axle assemblies can swing independently in a vertical plane. Aside from considerations of cost of production, the design seems to be excellent, but there can be no doubt that the truck would be quite expensive to build.

If we assume that the axis of oscillation of the axle halves is located a distance b below the axis at the inner end of the axle shafts (b is equal to the center distance of the worm gear) then the effective tread when the inner end of the axle shaft (in the plane of the worm and wheel) is a distance a below the outer end (in the plane of the road wheel), is given by the equation

$$T = 2 \sqrt{t^2 + 2a(r - b) - a^2}$$

With such oscillating axles as here discussed the problem of transmitting the driving thrust or driving force to the chassis frame arises. If a radius rod were used at the outer end of the axle the point of its connection to the axle housing would move in a curved line marking the intersection of two spherical surfaces, rather than vertically, and the same applies if the con-

ventional semi-elliptic springs are used. In the majority of designs using this type of axle the inner end of the axle housing is supported within the center housing or differential housing in such a way that the driving force is transmitted to the latter. This requires that the inner end of the axle housing be formed with either one of two cylindrical sectors which can slide angularly in spaces between corresponding cylindrical surfaces formed on the center housing. If only a single sector is provided it must be of a radius substantially equal to that of the center housing, as well as of considerable length in the fore-and-aft direction, so as to give the necessary rigidity of support in case of a sudden application of the brakes, for instance. Where there are two cylindrical sectors the inner end of each axle housing is formed with a fork and the sectors are mounted in trunnions at the front and back respectively of the differential housing.

It is obvious, however, that if there is no connection between the outer ends of the axle and the chassis frame through which the driving force may be transmitted, and on which brake retarding forces may be

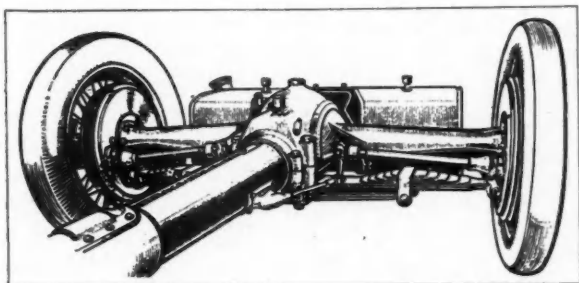


Fig. 9—Austrian Daimler rear oscillating axle, front view (from *The Motor*)

taken up, the pressures on the bearing surfaces at the inner ends of the axle housings will be quite intense under certain conditions. Therefore, in a number of the more recent designs the driving force is taken on some form of radius rod. Thus in the Steyr, illustrated in Fig. 7, a radius rod is mounted on the axle tube near its outer end. The forward end of the rod has a universal connection on the outside of the frame side member. The rod also extends some distance to the rear of the axle and has the end of the inverted half-elliptic cross spring shackled to its rear end, the spring being bolted to the under side of a rearward extension of the center housing. Steyr makes the following claims for its rear suspension:

"The center housing is supported on the frame and the wheels are entirely independent of each other, which results in better springing and particularly in better road-building qualities of the vehicle. The arrangement, moreover, offers the advantage that the body can be placed lower, since the center housing does not bob up and down relative to the chassis. The chassis frame thus is supported at three points, that is to say, by the center portion of the rear cross-member to which the differential housing and the cross spring are secured, and is practically indeformable; and even

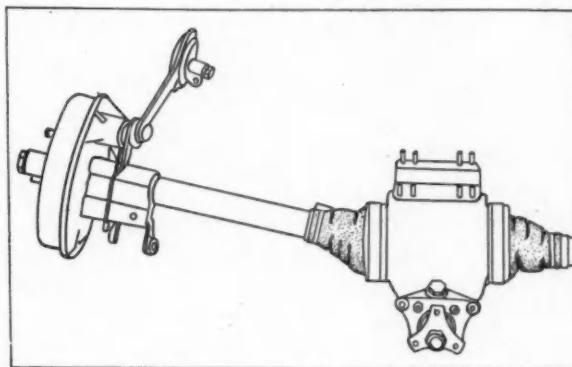


Fig. 8—Oscillating rear axle of Roehr eight-cylinder car + + + +

though one wheel should be passing over an obstacle and the other simultaneously drop into a hole, there is no distortion of the frame."

In the Roehr eight-cylinder car with oscillating rear axle the driving thrust is taken on half-elliptic cantilever springs. The center housing is bolted to a frame cross-member from underneath. The axle tubes have spherical connections with the center housing at its sides so as to permit them to oscillate freely.

Oscillating rear axles have been used also in the Austrian-Daimler car for a number of years, and pen-and-ink sketches of this construction, which have appeared in British automobile publications, are reproduced herewith.

There is an inverted semi-elliptic cross spring mounted on the center housing on its under side. To the ends of this spring are clipped two half-elliptic cantilever springs, the outer ends of which are shackled to the brake backing plates. The cylindrical extension of the center housing toward the rear indicates that one of the trunnions for the axle tubes is located there and the other inside the large diameter tube which extends from the center housing forward and forms a tubular backbone taking the place of the conventional pressed steel axle. The body is supported on this tubular backbone on outriggers similar to those used for bus bodies.

With any construction of this type the torque reaction, of course, comes on the center housing and need not be specially provided for, since this housing is rigidly fastened to the frame.

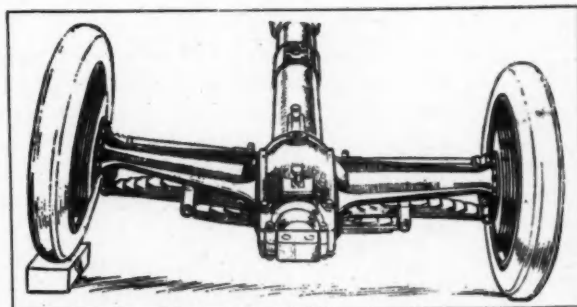


Fig. 10—Austrian Daimler rear oscillating axle, rear view (from *The Auto-car*) + + + + +

Dr. Person is Worried

DR. H. S. PERSON, secretary of the Taylor Society, broke into print recently with the following ideas about the automotive industry:

"In the automotive industry the spread between the factory cost and the selling price is excessive. It is the natural outcome of intensely competitive methods built up to meet an intense demand. When a saturation point is reached and demand represents the normal increase in business plus replacement needs, competitive methods will be so modified and channels of distribution so reorganized as to effect economies which will replace, and, perhaps, more than replace, losses which may result from a lessened demand.

"The specifications of the leading automobiles in this country are so well known and quality standards and style aspects so uniform that there is no reason why they should not be sold by mail-order houses, department stores and even small stores which carry other merchandise lines.

"The economies effected by that method would be tremendous when compared with the present expensive dealer sales organization."

This Saturation Point Again

DR. PERSON is a former college professor and an eminent economist, but if his analysis of the automotive situation and its future is correct, then Alfred Reeves is Amos 'n' Andy in disguise.

To begin with, as we tried to point out again not so long ago,

JUST AMONG

the saturation point—when, as and if reached—in no sense means a lessened demand. It merely means reduction to a minimum of the rate of increase in demand. The most vehicles we ever built in one year was in 1929, when the total reached about 5,600,000. When the "saturation" point finally is reached there is every evidence that we will be building that many or more vehicles every year just to replace those worn out—and be a darned sight more sure in advance that we are going to build them than we are today.

Is the Spread Excessive?

IN the second place, Dr. Person's statement that the spread between factory cost and selling price of automobiles is *excessive* is at least inaccurate; we believe it to be untrue, but that all depends upon one's definition of "excessive."

The spread is excessive if compared with what it would be if merchandising methods were 100 per cent efficient and there were no used car problem.

The spread is in no sense excessive if compared to that in scores of other industries. The dollar will buy more automobile today in comparison with ten years ago than of almost any other manufactured product. The spread between factory cost and selling price ranges from 17½ per cent to about 35 per cent, with a vast majority of cases at 27 per cent or under. The spread in plenty of products

is 50 per cent, while spreads of 100 per cent or more are not uncommon.

Problems Difficult For Mail Orders

IN the third place, Dr. Person knows not whereof he speaks when he states unequivocally that "there is no reason why automobiles should not be sold by mail-order houses, department stores and even small stores which carry other merchandising lines."

We can name plenty of reasons why they shouldn't, but hesitate to take the space because these reasons are so well known to the average reader of this page. Perhaps mention of a few of the more important reasons will suffice, namely, used car trading, service necessities, and the need for specific merchandising activity behind individual products of so complicated a mechanical nature.

As soon as one begins to wave aside these factors with economic theory, one gets down into the "ought-to-but-isn't" school of business reasoning.

If the Doctor Were Only Right!

WE only wish Dr. Person were correct in his statement about specifications of leading makes being so well known and quality standards and style aspects so highly uniform.

We will guarantee to prepare a list of 25 questions about specifications of current auto-

OURSELVES

mobile models on which no group of ten laymen can make a grade of more than 50 or 60 per cent—and they won't be trick questions either. No dead level of standardization has been reached by automobiles, either. Technical improvement in automotive products continues to go forward at a surprising rate considering the radical strides already made. If Dr. Person or anybody else outside the industry doesn't realize this, we would appear to be confronted with the need for more strenuous and effective merchandising rather than with the possibility of eliminating merchandising efforts—which have in them at least a modicum of educational as well as sales promotional value.

Prescription Needed to Improve, Not Change

UNQUESTIONABLY automobile distribution is faced with the necessity of increasing its efficiency. Wastes have been and still are common. But the automobile dealer performs an essential and integral function in the distribution of automotive products which cannot be displaced by a system applicable to alarm clocks, tooth paste and thingamajigs.

The future trend of automotive merchandising, as we see it, lies not primarily in the displacement of present forms of distribution and merchandising, but rather in the improvement, smoothing out and eliminating of waste in those forms already in existence.

Where House Organs Go and Where They Get!

FRIEND of ours made some kind of a survey on sales house organs put out in Detroit recently, and came back with the estimate that out of 106 house organs formerly sent out from Detroit, three-fourths have been permanently or temporarily discontinued.

Depression probably was the answer to many of them. The trend is interesting, however, because the sales house organ, which frequently performs certain functions very potently, often is assumed to perform a wider range of functions than it really does.

The house organ has the advantage of presenting to the customer exactly what the manufacturer wants to say in just the way he wants to say it without distracting thoughts about any other products or ideas.

In this very advantage lies its weakness. Its statements, editorial or otherwise, are always open to question because of the obviously biased source from which they originate. For this same reason, its reader interest is less than that of a bought and paid for publication treating of a variety of subjects pertinent to the subscriber's business in an unbiased way.

It is sound economics to predict that some of the money previously spent in house organs will find itself performing its sales purpose more potently in increased business paper space. We write this with full knowledge of the fact that it amounts to "boosting our own stock," but with a sincerity of belief that perhaps outweighs our tact.

Monuments to Industry Are the Men Who Serve

THIRTY-ONE inches of single-spaced typewritten names crossed our desk the other day along with a brief note from E. C. Shultz, advertising manager of Pratt & Whitney Co., that great old machine tool company whose roots run back deep into New England industrial history.

That list, containing names of about 200 men, practically none of whom we knew personally, brought to us a refreshing draught in the desert of depression; a warm glow in the chilly field of pressing industrial hardships.

It was a list, Mr. Shultz said, "of men who have served Pratt & Whitney Co. for twenty years or more."

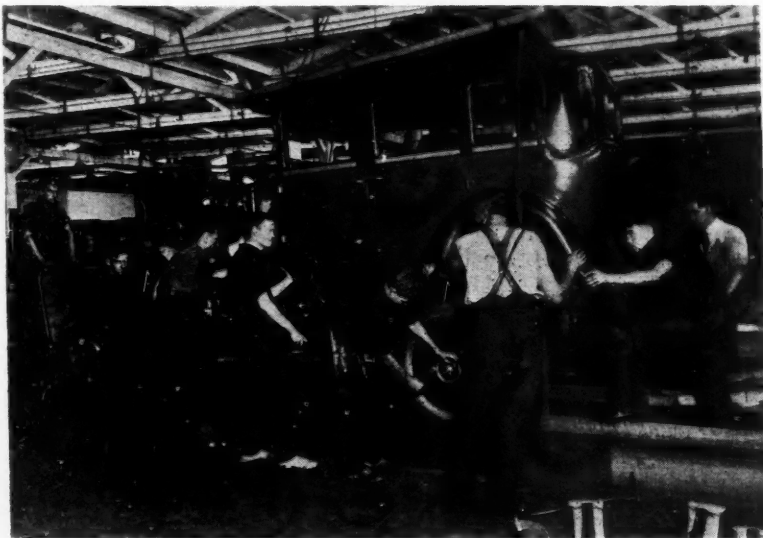
It revives one faith in American industry just a bit to get a list of that kind just at this time. Many other companies in the automotive and allied industries have in their employ scores of faithful, effective workers who have stood by the company and by whom the company has stood through storm and strife for many, many years. The necessary hardships which have been visited upon numberless individual workers during this as well as other depressions are balanced a little by lists like this one.

Lists these are, not of the Cabots and the Lodges, but of the real aristocrats of American industry—the Lesniaks, the Fagans, the Hennesseys, the Johansons, the Hochmuths, the Marxs, the Steidels—the men who do the work by brain and by hand. Fine human documents are these lists of men who have served; fine monuments to American industry as well as to the men whose names are therein inscribed.—N. G. S.

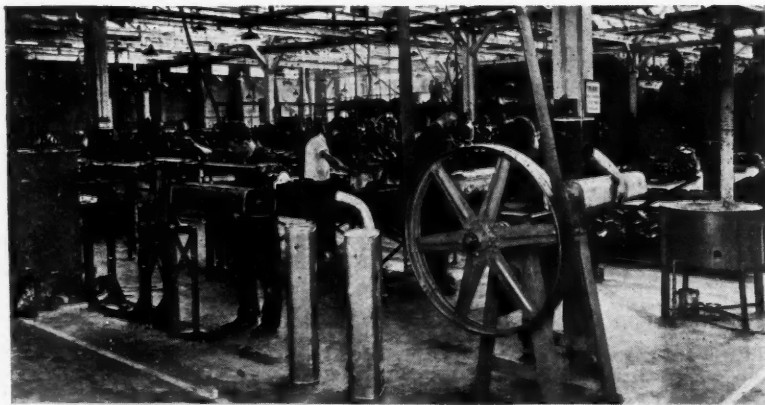
American Cars in Australia Have Major

Importing a bare chassis, engine and transmission, local industry adds Australian-built bodies and equipment to prepare the car for the purchaser

THREE-QUARTERS, on an average, of the purchase price paid by the Australian for his American automobile stays in the Commonwealth.



An Australian-built body on the assembly line, General Motors plant at Marrickville, Sydney + +



The gasoline tank shop, G.M.C. plant, Marrickville, Sydney, N.S.W. + + + + +

"Down Under"—

This the last of a series of three articles on Australian automotive trends written by Hugh Croll especially for *Automotive Industries* + + + + +

This high percentage of Australian increment in the motor industry is attributable largely to the enterprise of the Australian himself with the backing of extensive primary resources and protection of the tariff. Distributors of American cars freely admit that this major ratio of "British content" has become an important factor in sales promotion.

The American automobile arrives in Australia a bare chassis, engine and transmission. From then on, local industry completes the car for the road.

While Australian workmen set up and test the chassis, Australian-built bodies, batteries, tires, paint, nuts, bolts, upholstery, minor equipment and finishings pour into assembly plants to prepare the car for the showroom and purchaser.

Few among Australia's public, of whom one out of every ten owns a motor vehicle, realize the extent to which the so-called "Yank car" is really Australian. Were Australians more conversant with the scope of their home motor industry they would think in terms of the "nationality" of the name plate rather than the complete automobile.

Given thus the chassis, engine, transmission and stripped wheels, the Australian workman completes the car and in so doing puts into the job accessories and equipment the origin of which is 75 per cent in his own commonwealth.

General assembly plants are maintained by the principal American automobile corporations at Sydney, Brisbane, Melbourne, Perth and Adelaide. To these centers come from all over the

Ratio of British Parts and Accessories

By Hugh Croll

country manufactured parts to complete the car.

Outstanding in the local motor industry is body-making. Leading this field is Holden's Body Builders, Ltd., with a plant covering 40 acres at Woodville (Adelaide), in the state of South Australia, which is almost equi-distant by rail from all the main centers of assembly. This concern started about 14 years ago with a capital of \$125,000 and during its first year of operation used material to the value of \$450,000, 45 per cent of it being Australian produced. At the present time Holden's capital is about \$5,870,000, and material utilized in 1928 (the peak year before the slump) amounted to the sum of \$7,500,000; 75 per cent of it being of Australian origin. The few smaller body-builders of the Commonwealth have shown similar growth. Before economic stringency cut into employee rosters, Holden's had 4300 men at work on an average payroll of \$115,000 per week. Machinery and equipment in this plant is 50 per cent Australian manufacture, the whole concern involving an expenditure of \$3,750,000 for equipment and \$2,500,000 for structures.

Next in importance and investment are the metal accessory manufacturers.

With unlimited raw material available, the iron and steel industry centers about Newcastle, three hours by train north of Sydney, where the Broken Hill Proprietary Company has established smelters and general plants. In South Australia, at Iron Knob, there are deposits estimated at 110,000,000 tons. From here the crude metal is sent 50 miles to Port Pirie, where are situated the largest smelting works in the world. Alloy components and auxiliary minerals and metals necessary to the finish and equipment of automobiles are all mined in Australia—antimony, asbestos, coal, chromite, cobalt, copper, gypsum, lead, manganese, mica, molybdenite, phosphate, scheelite, tin and zinc are but the principals.

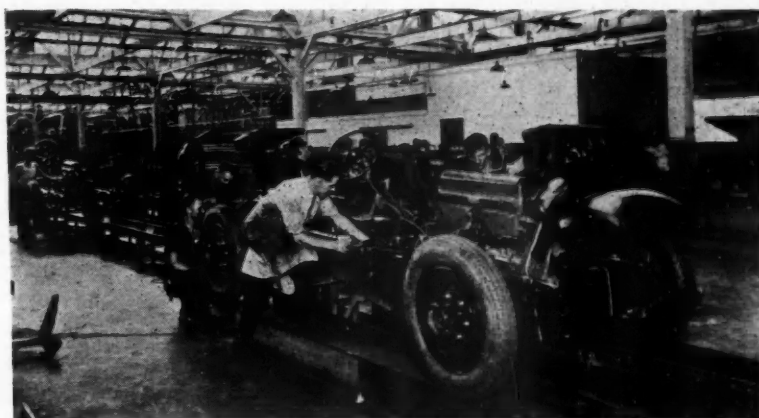
Timber used by body-building concerns, to the total of about 5,000,000 super. ft. annually, is 75 per cent milled in Australia, the balance being imported from New Zealand.

All-Australian Car Coming

The latest Australian tariff is a long step toward the ultimate building of a complete motor car in Australia, according to John Storey, president of the Automobile Manufacturers' Association (Australia).

Individuality is given to hitherto submerged parts in the new schedule, he said. Many accessories are now definite from the hitherto inclusive term "chassis and parts thereof," he pointed out, and Australia's manufacturers can thus thank the present government for helping the Commonwealth along the road to independence in the building, from engine to paint, of her automobiles of the future + +

The one-and-a-half million square feet of leather that it required for cushion and body finish is wholly an Australian product. Special paints and enamels, 40,000 gal.; thinners, 30,000 gal.; under-



The main assembly line, General Motors plant, Marrickville, Sydney + + + + +



Sheet metal cleaning unit, G.M.C. assembly plant at Sydney + + + + +

coats, 17,500 gal., and cloth, 40,000 sq. yd., are all of Australian preparation, manufacture or fabrication. About 30,000 sq. yd. of extra-fine cloth, imported from England, also is used.

Likewise are imported from England for use by the Commonwealth body-building concerns 350,000 sq. yd. of burlap, 250,000 of bow covering, 45,000 of carpets and about 5000 lb. of thread.

Sixty per cent of what little sheet steel is imported is American, the remainder English.

Most all else required by the body builders is manufactured in Australia of Australian primaries.

These supplies include: Miscellaneous castings, 400 tons; nails, 70 tons; 1,750,000 bolts; screws, 250,000 gross; hood lights, 35,000; curtain fasteners, 4,000,000 units; chipboard, 150 tons; leather cloth and hood fabrics, 750,000 sq. yd.; upholstery paddings, 300 tons; glass products, 300,000 sq. ft.; rubber products, 200,000 lb.; wire, 1500 tons, and bar steel, 300 tons.

Figures given above are the aggregate of unofficial estimates as for the peak of the industry's activity about a year ago before recessions due to the current slump.

Despite trying times, the Australian motor industry is optimistic, according to John Storey, president of the Automobile Manufacturers' Association, who said that the new tariff schedule gave an individuality to many parts of a motor car which hitherto were submerged in what was defined in the customs lists as "chassis and parts thereof."

The motor industry in the Commonwealth has been directly instrumental in the development of several important Australian enterprises, according to figures supplied by the Manufacturers' Association.

Notable among the markets opened up and nurtured by the auto body and accessory industry is cotton-growing in Queensland, the most northerly eastern state on the island continent and which has a climate comparable to that of the cotton-growing South in U. S. A. A considerable proportion of the padding required for seats and squabs is prepared by an all Australian cotton-growing company operating in the state.

Die-casting is another industry which owes much of its success to the demands of motor-body finishers. Door handles, foot and robe rails and miscellaneous small extras are cast in steel dies from an alloy of which Australian zinc is the principal constituent.

The tariff-stimulated demand for Australian tires



A birdseye view of the G.M.C. plant at Marrickville, Sydney + + + +

means payrolls in the main companies operating in the six states—the Dunlop, Barnet Glass, Perdriau and Goodyear companies. The advent of the automobile proved a considerable stimulus to the Australian rubber industry, which dates back 50 years. In 1914 the capital invested in this undertaking was about \$3,500,000, and in 1928 that total had jumped to \$22,500,000. Empire trade, of course, enters largely into the rubber industry with about half the cotton coming from Egypt and the same proportion of the crude rubber emanating from various British spheres.

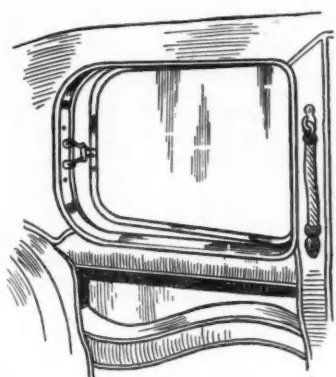
Batteries, too, now all Australian built, were almost wholly imported only three years ago. The bolt, nut and screw industries also carry on the same story of development fostered in no small degree by the requirements of the local automotive manufacturing and assembly plants.

Lastly is the replacement parts industry, too highly competitive perhaps, but the small manufacturers are myriad. The new tariff, too, has given a fillip to spring fabrication and nickeling and polishing—the schedule providing heavy loadings for all nickeled or similar parts. They must be landed in an unfinished state, and the Australian surfacer or polisher will complete the job.

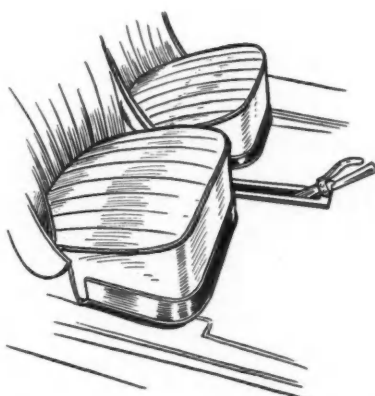
Motor accessory plants and assembly works, of course, use mainly Australian equipment: Australian-made lathes, electric motors, electric cranes, furnaces, steel lockers, manual trucks, wood-working machinery, bench equipment, office equipment, heating apparatus and small general accessories and tools.

This all, too, is being carried out on the slogan, "Australia for the White Man," and there are a little less than only 6,500,000 all told on the whole continent.

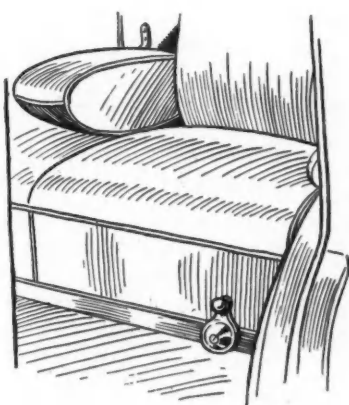
Changes Shown at the Olympia Show Are of Smaller Details



Hinged quarter-light for ventilation on Humber and Hillman sedans



Wolsley Viper central brake lever



Humber folding armrest and control of adjustment of cushion position and angle of backrest + +

For the first time left-hand drive is offered by two makers for export trade

by
M. W. Bourdon

AS will have been gathered from the cable report on the Olympia show, there were no radical mechanical innovations, but deviations from previous practice were numerous and quite pronounced in some instances.

Aluminum or aluminum and steel pistons are in practically universal use, and the invar-strut type is very popular. Duralumin connecting rods have not gained appreciably. Star continues to use centrifugally cast cylinder liners, alone among British passenger car makers.

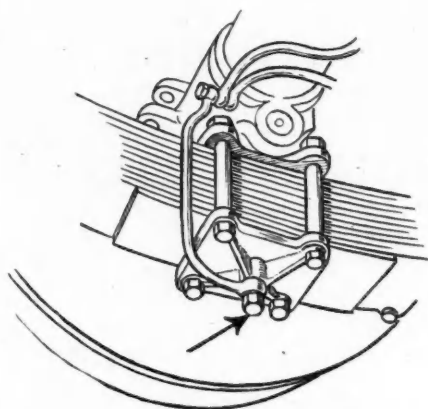
In regard to carburetion the only development worthy of note is the adoption by Humber and Lea-Francis of the down-draft Stromberg carburetor, these being the first British makers to do so. Additional makers have adopted fuel pumps in place of vacuum feed, but the latter is retained by many firms and appears on several new models. Nearly all the small cars have gravity feed with the tank attached to the dashboard, the Singer Junior, with vacuum feed, being an exception.

Air cleaners appear on more cars than hitherto, the A.C. in most cases; Rover, Armstrong-Siddeley and Lea-Francis have adopted a combined air cleaner and intake silencer with a metallic wool filling; a vacuum whistle at the carburetor end sounds when the wool becomes choked and cleaning is called for.

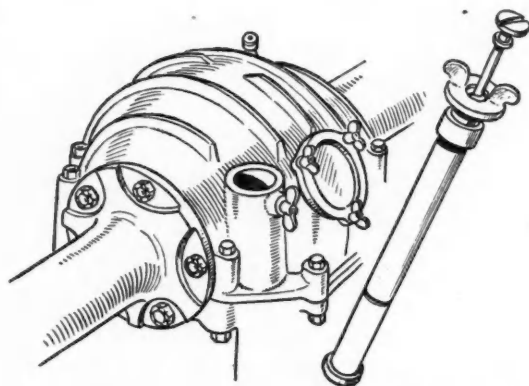
Morris has extended to the overhead camshaft Isis Six (the export model), the "fume consumer," originally devised for the side-valve Oxford Six. This consists of an aluminum cover for the cylinders (and for the valve gear of the Isis) with a compartment filled with horsehair; the crankcase breather extends upward into this compartment and through the latter also passes the air for the carburetor intake. It forms, therefore, an air cleaner as well as carrying into the cylinders the fumes issuing from the breather.

A similar scheme has been applied also to the Rover cars, in which the carburetor air passes into the cylinder cover through the air cleaner just mentioned.

The only development in connection with engine lubrication is the provision of more efficient filters. The A.C. by-pass filter is used in some cases and the Auto Klean disk filter in certain others. On two Morris models the latter is coupled to the clutch



Lead to hollow assembly bolt of springs from Sunbeam centralized lubrication system + + + + + + + +



Daimler rear axle charging pump, also forming oil level indicator + + +

pedal, so that each time the clutch is used the movable disks of the filter are partly rotated to clear away foreign matter, which falls off into the filter sump. The new Daimlers also have this type of filter, but with a T handle for periodic manual rotation. Alongside the cleaning handle on these cars there is a lever to open the filter sump drain.

Apart from the extended use of a separate shell for the radiator and the provision on many more cars of thermostatically controlled radiator shutters, there is no development of note in water-cooling systems. Flexible engine mountings are now confined almost exclusively to the use of rubber blocks of various forms, with four-point suspension as a rule. Humber and Hillman are the first British makers to offer left-hand steering and controls for export, if required.

Four-speed gearsets have greatly increased on British cars of all sizes; even the Singer Junior now has four though it is at present unique in this respect among 8-hp. cars. This greaset has straight-toothed pinions throughout, but in other cases where four speeds have displaced three, helical or herringbone teeth are used for the constant-mesh and third-speed gears. Makers who have either standardized or offer on "de luxe"

models this four-speed silent-third transmission are: Riley, Humber, Sunbeam, Hillman, Star, Rover, Standard, Bentley, Crossley, M.G. (a Morris subsidiary), Lea-Francis and Talbot. No British maker has adopted a "free-wheel" in the transmission and none now offer it as an optional equipment, as in a few cases two and three years ago. Nor is any maker providing special means to facilitate gear-changing, except Armstrong-Siddeley and Daimler with "self-changing" gears.

Hotchkiss drive is now almost universal in British cars. Flexible disk universals have disappeared from all but a few of the smallest models, and the Spicer metallic joint is in general use. Worm drive is exceptional. Standard, one of the few remaining makers using it last year, has adopted helical bevels for all models. Bentley, in a new model, has followed Rolls-Royce in using hypoid bevel gears. Rolls-Royce, having gained more ground clearance under the axle center by adopting hypoid bevels, is fitting somewhat smaller wheels to secure a reduced overall height of complete cars. Daimler has introduced a new feature in connection with rear axle lubrication. The filling orifice in the axle center is closed normally by the upper flanged end of a hand pump, the barrel of which forms a "dip-rod" for indicating the oil level. If fresh oil is required, it is inserted by charging the pump, reinserting the latter in the filling orifice and pushing down the pump plunger.

Few Changes in Braking Systems

Development in braking concerns details only. There has been a widespread stiffening of cross-shafts and the provision of more convenient means of adjustment adjacent to the actual brakes, for the tendency is to cut out a central service adjustment and to provide individual adjustments only. Equalizers have practically disappeared, except as between front and rear sets. The vacuum servo has not gained more adherents, though Singer fits it on two models instead of one; Daimler uses it on all models; Bentley, Lanchester and Sunbeam on two; Rover and Hillman fit it on de luxe models only.

Lockheed brakes are fitted to both of the Triumph models and on two of the Morris range. Sunbeam has adopted the Lockheed for the smallest model (16 hp.), but with a variation from the standard arrangement in that the rear-wheel shoes, operated hydraulically by pedal with the front ones, as usual, can also be set by hand for parking.

It is now the general practice to provide only one set of shoes in the rear-wheel drums for both pedal and hand operation. Additional "hand-brake" shoes have become exceptional.

Independent springing finds no place on British cars yet (apart from the front-drive speed model Alvis). Shock absorbers with orthodox half-elliptic springs are standard practice, though there is no general acceptance of any one fundamental shock absorber type, various makers using frictional or single or double-acting hydraulic. Austin is alone in using zinc inter-leaving for the spring plates.

Daimler again uses an aluminum front axle on a new

six, but on the new twelves has reverted to steel. Cam steering (either Marles or Bishop) is rapidly displacing worm gears. Finger-tip controls are found on many more cars this year; the lamp switch lever generally actuates the dipping headlights in one position, for this anti-dazzle provision is standard on the majority of cars selling at over £200.

The most notable development in bodywork is the new Weymann semi-paneled body. This has an almost orthodox all-fabric Weymann framing, consisting of three "cells" (cowl, center and rear) united at top and bottom by articulated joints; the panels are fixed to these cells by screws. The doors have flexible joints for their timbers and to these the panels are secured by screws, with felt intervening to permit flexing. The panels are lined with fibrous anti-drumming material and the seating is attached directly to the chassis as with the fabric bodies. The result is that the flexibility, silence and low weight of the fabric Weymann are secured with a more attractive appearance due to the lacquered panels. A body of this type is being offered by the Standard Motor Co., a five-passenger sedan fitted to a new 20-hp., 2½-liter six, the price of which is £385 with a four-speed silent-third gearset.

For a new 16-hp. overhead camshaft six with a wheelbase of 117 in., termed the Wolseley "Viper," Morris (who owns the Wolseley Co.) has standardized two sedans, an all-fabric at £285 and an all-metal at £299. The latter body (like all the steel bodies for Morris cars) is made by the Pressed Steel Co. of Great Britain, Ltd., established by the Budd Mfg. Co. in conjunction with Sir William Morris near his own plant at Cowley, Oxon. Several other British makers for the first time are using bodies made wholly or partially by the Pressed Steel Co.—Rover, Austin, Humber and Hillman, for example—but these are of the composite type.

All-fabric bodies are still included in their offerings by most makers. As a rule they are lower-priced than the metal body. As an instance of comparative fabric and metal sedan prices, the case of Essex cars in England may be mentioned. The standard (American) all-metal sedan on a 113-in. wheelbase chassis is priced at £245; an English-made fabric sedan on a 110½-in. wheelbase, with four doors, six lights, pneumatic upholstery in tan hide, sliding bucket front seats, roof and side ventilators, etc., is £225.

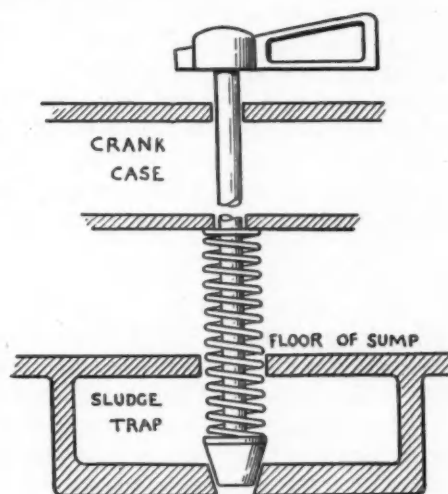
Wider Bodies With More Headroom

Bodies generally are somewhat wider and have more headroom, thus Rover and Standard on their 10-hp. models have added 3 in. to the seat width. Radiators have been redesigned in a large number of cases, and altered out of all recognition. They are higher, and extend lower, and usually have slightly curved sides (in front elevation) finishing narrower at the bottom than at the top. A central plated strip is often fitted at the front. In a few instances the plated shell is much narrower than hitherto in front of the hood.

The higher radiators have, of course, been accompanied by higher hoods, and yet there is no evident increase in the general height of waist lines, for the new and higher hoods generally are horizontal at the top

instead of being higher at the rear. The excessively high waist line with shallow windshield and windows, against which Sir Herbert Austin protested in his presidential address before the Institution of Automobile Engineers, is found mainly on the custom-built bodies of large cars. There has been a reaction in this respect as also with respect to very wide doors for two-door bodies.

Some form of "sunshine" roof, usually a sliding front section, is either standard or an optional extra on the sedans of practically all makers. Morris uses a sliding roof for some models and a folding half on



Engine oil filter on new Double Six Daimler with level indicator alongside. Below the indicator is the sump drain lever; rotation of the T-handle cleans the oil filter and the hexagon to the left clears the deposit from the filter sump + + +

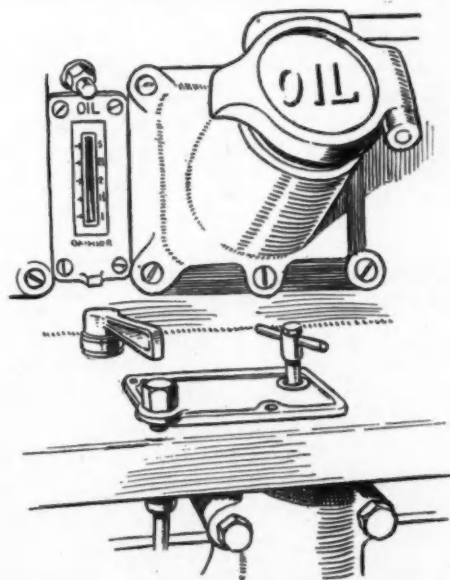


Diagram of Daimler combined sludge and oil drain. When the valve is fully raised only the sludge trap is drained. To drain the sump the valve is raised half-way + + + + +

others. There is no doubt that this feature is appreciated by the majority of buyers; many will not now buy a sedan without it. Humber has introduced a new body style termed the Sesame saloon; this has a section at the front sliding back over a fixed central section and a folding rear end like a landaulet.

Humber and the associated Hillman cars are the first to have hinged quarter lights for ventilation. Each light is hinged at its front end and can be opened 2 in. or so at the rear end, held thus by a toggle that passes over dead centers to lock the window in either the open or closed position. An extractor effect is said to be set up by the opened windows projecting into the air stream alongside the car. Glass louvers (wind and rain deflectors) over the door windows are now widely used.

Humber is the first British maker to provide an adjustable rear seat. There is a small crank handle, near the floor level, secured to the heel board, and operating this draws the cushion forward and increases the angle of the back squab. A central folding armrest, heavily upholstered and sprung, is provided, a feature that appears for the first time on quite a number of sedans. Side armrests for the rear passengers are also a new provision on a great many cars, even the small sedans. Singer, for one, provides a recessed armrest at each side at the rear, and Armstrong-Siddeley has the same type in each front door.

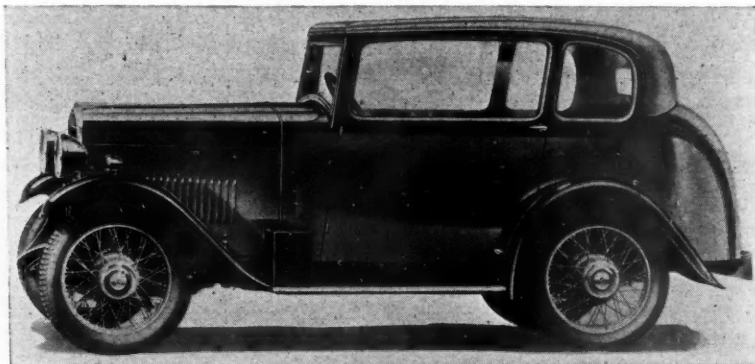
Signaling Window Provided

Star sedans now have a special signaling window in the driver's door. The drop window panel has a full-width horizontal section about 6 in. deep, pivoted below the main sheet. If the window is closed, the driver, to signal with his arm, merely pushes against the hinged



Humber "Sesame" sedan. Tables and footrests fold up into the backs of the separate front seats + +

November 1, 1930



New Triumph "Scorpion," now smallest British Six (73 cu. in. displacement); wheelbase 87 in., track 42 in. Price with miniature four-passenger sedan £237 + +

section to open it; it then remains extended for further signals or can be reset vertical. If the window as a whole is lowered as usual by a crank handle, the hinged section automatically moves to its vertical position. Star and Austin sedans (other than the Austin Seven) now are distinctive in having tables that can be folded into recesses in the backs of the separate front seats. Similarly folding footrests, collapsing within a recess in each front seat back, just above floor level, are provided by several makers. Vauxhall has a well of V section extending across the floor, normally enclosed by a hinged and carpeted lid; the latter when raised forms the upper half of a sloping footrest, the passengers' heels resting in the well.

Separate and adjustable front seats are almost universal and generally have more curvature to the back, with better sprung and more thickly padded upholstery.

Innovations Must Give Service

In his presidential address to the Institution of Automobile Engineers, Sir Herbert Austin said: "One important matter the designer has always got to face, and must combat, and that is the insistent demand for change for change's sake, chiefly from the sales end of the business to induce sales. A change of design that does not improve the running of the vehicle, its efficiency, or in the case of the passenger car, its satisfaction to the owner, will not last. Slight modifications of shape in outward appearance are not of much moment, but if these cramp the accommodation and make for discomfort, they will sooner or later be discarded. A particular example referred to is the insistent demand for a lessening of over-all height, which has led to such a reduction of headroom in some cars as to make it positively uncomfortable to sit in them and dangerous to ride in them over bumpy roads. In hot climates the very low roof is particularly objectionable."

Automotive Industries

Army to Buy Motor Equipment Soon, S.A.E. Meeting is Told

(Continued from page 639)

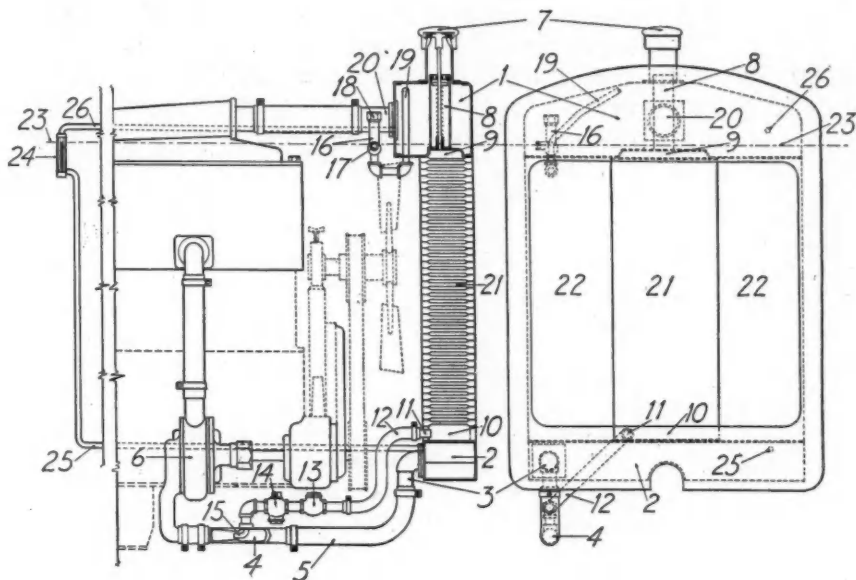


Fig. 1—Foutz evaporation cooling system described by Mr. Hughes + +

show the speed at which the vehicle in question will run on the level or ascend hills. The question of speed is given much attention by vehicle owners and obviously performance should be given in terms desired by purchasers. The meeting decided to investigate the wishes of fleet owners in the matter.

Mr. Wolf gave a table of data on 22 1-ton models, which have gross weights ranging from 6000 to 8000 lb., engine torques of from 1356 to 1800 lb.in., rear axle reduction ratios of from 4.64 to 6.63; total reduction ratios in low from 13.8 to 72.4, tractive factors in high ranging from 0.058 to 0.083 and tractive factors in low ranging from 0.178 to 0.665. The average tractive factor in high was 0.0699, as compared with 0.0766 for similar trucks in 1912, when figures on the subject were gathered by Cornelius Myers.

Data of the same character were presented also on 22 2-ton trucks with gross-weight ratings ranging from 9000 to 15,000 lb., engine torque (maximum) ranging from 1536 to 2880 lb.in., rear axle reductions ranging from 5.22 to 7.25, overall reductions in low gear from 22.4 to 47.8, tractive factors in high from

0.045 to 0.071, and tractive factors in low gear, from 0.184 to 0.440. The average tractive factor in high was 0.0596, which compares with 0.0664 for similar trucks in 1912.

Three-ton trucks, also represented by 22 examples, have gross ratings ranging from 14,000 to 19,000 lb., maximum engine torques ranging from 2160 to 3624 lb.in., rear axle reduction ratios from 5.19 to 8.50, total reduction ratios in low gear from 32.9 to 93.5, tractive factors in high from 0.042 to 0.074, and tractive factors in low from 0.196 to 0.732. The average tractive factor in

high was 0.0535, as compared with 0.0607 in 1912.

Gross-weight ratings of 22 5-ton trucks range from 21,500 to 29,800 lb.; the maximum torques of their engines from 2640 to 4296 lb.in., rear axle ratios from 7.10 to 11.66; overall reduction ratios in low gear from 46.8 to 207.0, tractive factors in high from 0.038 to 0.077, and tractive factors in low from 0.200 to 1.070. The average tractive factor in high is 0.0534, as compared with 0.0605 in 1912.

It will thus be seen that the tractive factors of all classes of trucks in high gear have decreased since 1912, which reflects the improvement in roads made since then.

Performance indicating and recording instruments were divided into two groups by Carl W. Stocks, editor of *Bus Transportation*, the first making a permanent record of the performance of the vehicle which is intended as a check on operation, while the second are for the guidance of the vehicle driver. Instruments in the latter group include oil-pressure gages, air-pressure gages, ammeters, speedometers, odometers and engine tachometers.



Fig. 2—Recordograph of bus movement in city service

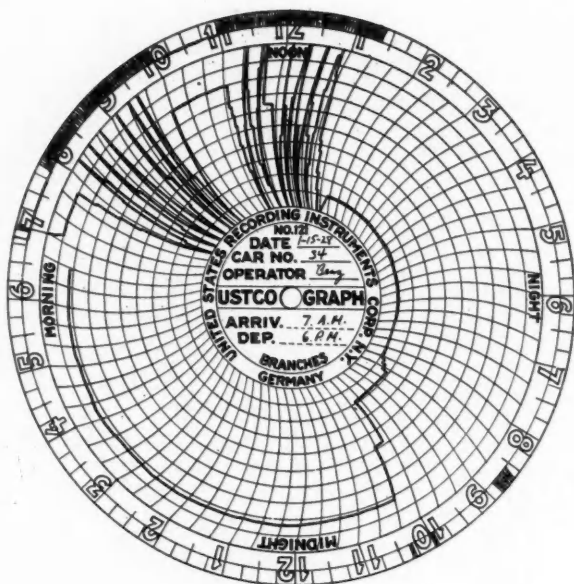


Fig. 3—Chart from an Ustcograph

An instrument, known as the "Servis recorder," is installed above the windshield on buses operated by a carrier in New Jersey. This device is of the vibrator type and consists of a hinged casting with an outward-opening cover, a clock mechanism which rotates a paper dial and a winding disk that also serves as a platform for the chart itself. A lock secures the cover and prevents access to the mechanism by unauthorized employees.

When in operation, a needle or stylus in the upper half of the casting is actuated by a pendulum which swings to and fro when the vehicle is in motion. This backward and forward movement of the pendulum marks the chart with a broad line while the vehicle is in motion and with a very fine line when no vehicular movement occurs.

Another instrument similar in purpose is known as the Ohmer Recordograf. It is a positive-drive type in that it employs a transmission-driven mechanism in conjunction with a clock movement, and utilizes

paper tapes in place of circular charts. It also incorporates an odometer feature.

In addition to furnishing a graph of vehicular time in motion, the Recordograf also charts details of speed and distance. With this information the fleet operator can determine not only the running time and the number of stops, but also the specific rate of speed for any given distance, together with the hour at which the speed was made. The paper or tape used has 36 vertical divisions, each representing 1 hour of elapsed time. Therefore, it is possible to record 36 hours of continuous operation before replacement of the tape is necessary. This feature is particularly advantageous in long runs that require more than 24 hours to complete.

Another instrument, resembling somewhat the two instruments just mentioned, is known as the Ustcograph time and mileage recorder. It also is of the positive-drive type and, in addition to the vibrator attachment which registers running and waiting time, has an odometer head for recording cumulative mileage.

The Ustcograph records on a paper disk differing somewhat from the disk used in the Servis recorder. The stylus or marker in this case is operated mechanically through a train of gears in the clock mechanism, its operation being regulated with regard to vehicle speeds through a calibrated reduction box attached to the speedometer outlet in the transmission gearbox, or else through a connection to the road gearbox on the front wheel. All connections are sealed to make the installation tamper-proof. The Ustcograph can be mounted either on the dash panel or at some convenient position inside the body or under the hood.

Still another type of instrument for the control of operation and the supervision of vehicles is offered in the Hasler bus recorder, a European product, the use of which in this country has been rather limited, due, no doubt to its cost, which is in the neighborhood of \$300.

The Hasler Tel Recorder is designed to give a much more complete record of performance than any of the three instruments previously described. The record is made on a paper tape, a part of which is shown in the rectangular opening at the top of the instrument. It can be installed on any vehicle having a speedometer

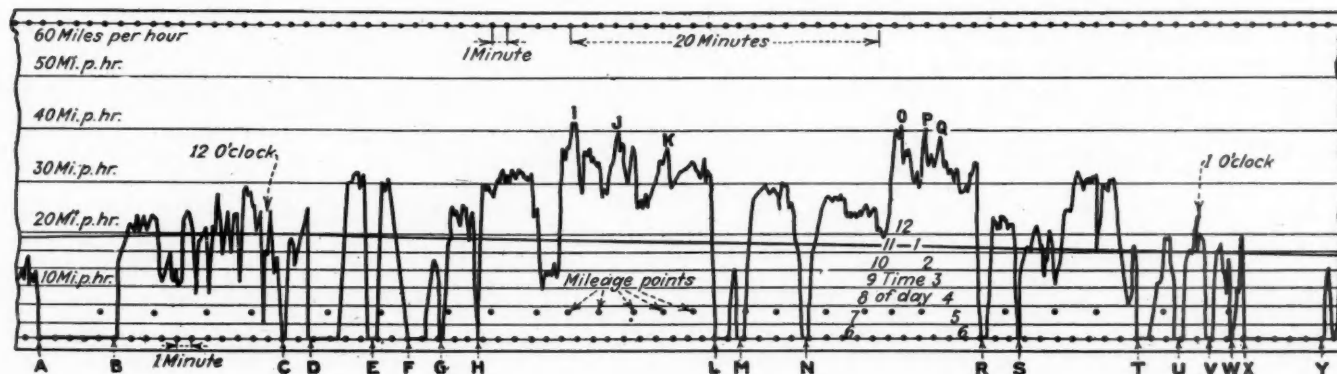


Fig. 4—Chart from Hasler Tel Recorder taken on a bus operating on a suburban line

driveshaft, and furnishes a permanent record of operating data, as follows:

1. Vehicle speeds attained during every second of operation.
2. Time and duration of runs.
3. Time and duration of stops.
4. Location of stops on a mileage basis.
5. Total operating time.
6. When the vehicle is moving, and when it is standing.
7. Trip mileage and total mileage and in addition
8. It indicates to the driver accurate vehicle speeds and the correct time of day.

Obviously, such records, in addition to their importance in operation, also provide valuable information in connection with the investigation of accidents, delays and the like.

Fig. 5 shows the unusually large face of a new instrument made by the AC Spark Plug Co. It con-

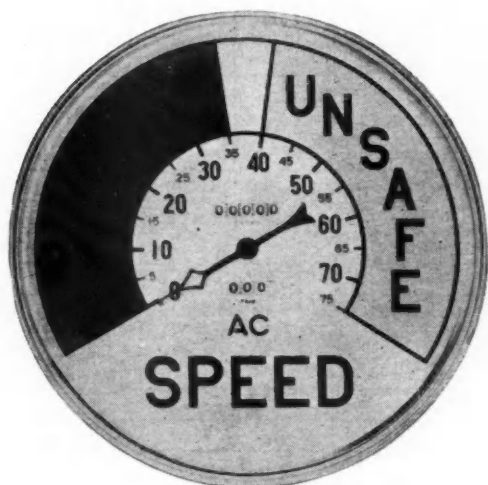


Fig. 5—The face of a new instrument made by AC Spark Plug Co. is unusually large

tains a clock-like mechanism which functions both as a speed indicator and a governor. The mechanism is driven by a standard speedometer-cable hook-up. It is mounted in a conspicuous place on the dash. The outer circle of the dial has been blocked off into segments colored green, yellow and red. When the indicator passes the red mark at 40 m.p.h. a bell inside the coach will ring until the speed is brought below the maximum. The governor arrangement inside the mechanism permits the maximum speed limit to be set to suit any desired operating range. This adjustment, however, is accessible only to properly authorized employees. An electric tally-mechanism is arranged so that, each time the speed limit is exceeded, the instrument registers on a small consecutive-number recording device.

Speedometer drives give much trouble in service, according to the speaker, and several who participated in the discussion. Instruments on many vehicles lack



F. R. Phillips, senior vice-president, The Philadelphia Co. of Pittsburgh, was the principal speaker at the banquet + +

accuracy or ruggedness, in the opinion of a number of fleet owners. Responsibility rests at least partly with vehicle owners who, not realizing the importance of these devices, are reluctant to pay the price for high-grade instruments.

A plea that the human element be given even greater consideration in engineering was made by F. R. Phillips, vice-president, The Philadelphia Co., speaker at the annual banquet, which was attended by more than 300 members and guests. He said that efficiency is valuable only so far as it lifts burdens from backs of men. Speaking of the low-floor street car, which he originated and introduced in the field, he told that aside from its efficiency as a transportation unit it saves two steps for each passenger carried.

Pittsburgh Section of the S.A.E., of which John Orr, Equitable Auto Co., is chairman, was host to the transportation meeting and received a vote of thanks for its hospitality.

THE Bureau of Standards has published a bulletin covering American National Standard Screw Threads (Coarse and Fine Thread Series). It incorporates the essential tables of dimensions of fastening screws as published in the 1928 report of the National Screw Thread Commission. The industry has since accepted and approved for promulgation through the Department of Commerce the limiting dimensions, tolerances and tap drill sizes given in the pamphlet and the standard became effective July 1, 1930. Copies of the publication (CS 24-30) can be obtained from the Superintendent of Documents, Washington, D. C., at 10 cents each.

High Heat Expansion Cast Iron Developed for Cylinder Linings

Alloy iron resists oxidation and is comparatively free from growth and is capable of free machining

IN the past the use of aluminum alloy pistons in internal combustion engines has been attended with more or less difficulty because of the great difference in the thermal expansion of the cast-iron in the cylinder block or liner and the aluminum alloy in the piston. More than one of the manufacturers who pioneered the use of aluminum pistons was compelled to return to cast iron temporarily because the problems connected with piston design for the lighter material had not been solved. Later on the chief difficulties were overcome by the development of the split-skirt and the invar-strut types of piston. Both of these represent what might be called mechanical solutions of the light-alloy piston problem.

Further effort is being devoted to the problem and two recent developments in metallurgy are of considerable interest in this connection, the production of aluminum alloys with a high silicon content, which have a coefficient of expansion from 15 to 20 per cent lower than the conventional piston alloy (S.A.E. specification No. 34) and of an alloy cast iron having a coefficient of expansion 50 per cent greater than that of ordinary gray iron. This new alloy iron, known as Ni-resist, has been developed at the laboratory of the International Nickel Company in Bayonne, N. J. It has the further advantages of being rust and heat-resistant, and some interesting experiments in regard to its use for cylinder liners have been made already by the experimental department of the Aluminum Company of America.

The properties of the new alloy iron were discussed in detail in a paper presented to the American Society for Steel Treating in Chicago, from which the following information is taken. The composition of the iron is as follows:

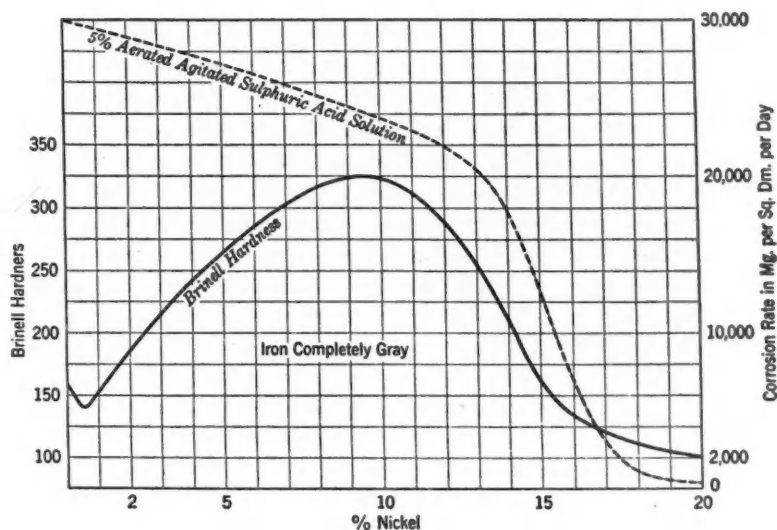


Fig. 1—Illustrating typical hardness and corrosion characteristics + + + + +

	Min. Per Cent	Max. Per Cent
Total Carbon	2.75	3.10
Silicon	1.25	2.00
Sulphur	0.04	0.120
Phosphorus	0.04	0.30
Manganese	1.00	1.50
Nickel	12.00	15.00
Copper	5.00	7.00
Chromium	1.50	4.00

The tensile properties of a 14 per cent nickel, 6 per cent copper cast iron, with the normal carbon and silicon contents, were found to be rather low, and various expedients became necessary to make these properties comparable to those of ordinary cast iron. This can be done by lowering the silicon or carbon content or by adding chromium. The addition of chromium to the alloy appeared to be the most practical way of accomplishing this result and at the same time taking advantage of such useful properties as the chromium addition contributed. Since the iron with-

out chromium might be as soft as 100 Brinell, the presence of something like 2 per cent chromium brought it up to 140 Brinell, so that its hardness compared quite favorably with that of plain cast iron. Larger additions of chromium continued to increase the hardness, roughly, 20 points Brinell for each 1 per cent additional chromium, so that at 6 per cent chromium, a Brinell hardness of 220-240 is obtained. This hardness is somewhat excessive for ready machinability, and a limit of 2 to 3 per cent chromium is usually recommended. The ability for the alloy to be hardened is helpful where great resistance to wear and deformation is required. As a matter of fact, the iron can be chilled just as ordinary cast iron, and a Brinell hardness of 350-400 attained.

For most purposes, however, the free machining combined with good gray iron physical properties are desired, and with this purpose in view a composition was standardized upon at approximately 14 per cent nickel, 6 per cent copper, 2 to 3 per cent chromium, with carbon around 3.0 per cent and silicon as in ordinary cast iron. Amsler wear tests of the brake-shoe type upon the alloyed iron of a standard composition against plain cast iron indicated that its wear resistance was nearly five times that of the plain iron under the same conditions. Naturally, wear tests require a close definition of details of procedure, but these results indicated quite definitely that the alloyed composition would wear well, presumably due to its inherent toughness as well as resistance to surface breakdown under heat.

By varying the carbon and silicon composition, with other elements remaining the same, this iron will develop the following range of mechanical properties:

Arbitration bar transverse strength	2,500—4,000 lbs.
Arbitration bar transverse deflection	0.2—0.3 inches
Tensile strength in 1¼-in. section	20,000—35,000 lb. per sq. in.
Brinell hardness	120—170

Considerable work has been done toward determining the corrosion resistance of this alloyed iron in various corrosives both in the laboratory and in the industrial field. The test results suggested the use of corrosion-resistant cast iron in practically every service requiring a better performance than plain cast iron offers; in some instances the results are better than those obtained from non-ferrous alloys.

The alloyed iron, if produced to the standard specification of 14 per cent nickel, 6 per cent copper, 2 per cent chromium, possesses not only the physical properties common to ordinary cast iron, but also the machinability. If the composition is hardened by chromium additions, above 3 per cent, its machining speed will greatly decrease. Hardening the iron in this way may reduce the speed to as low as one-half of that of soft gray iron. The much greater toughness of alloyed cast iron requires that it be made softer by 30 to 40 Brinell units to have it machine at about the same rate as a corresponding plain gray iron.

The coefficient of thermal expansion for temperatures up to 600 deg. Cent. (1112 deg. Fahr.) is 50 per cent greater than that of plain cast iron, and

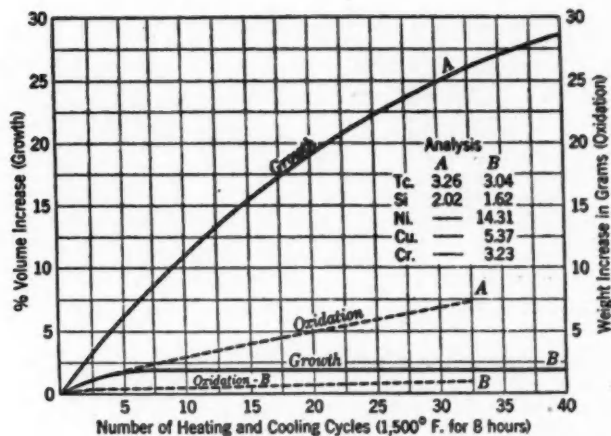


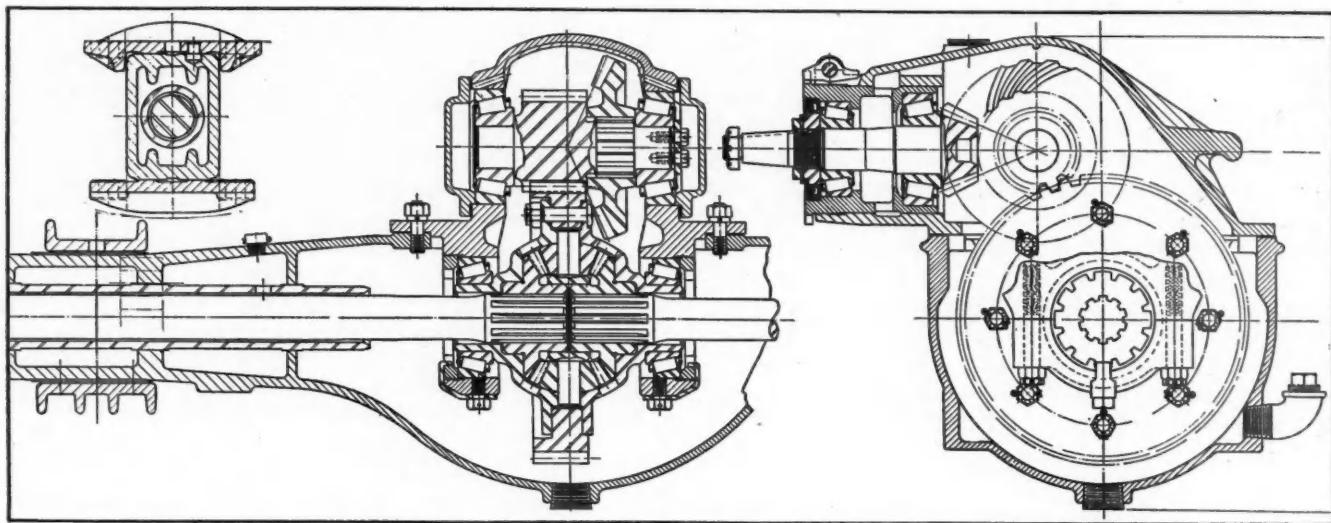
Fig. 2—Typical curves of oxidation and growth of plain cast iron (A) and corrosion resisting cast iron (B) at 1500 deg. Fahr. + + +

therefore similar to that of bronze. This factor has been useful in development work in connection with its use as a sleeve in automotive, aircraft, and marine engines, in conjunction with aluminum alloy pistons. Since aluminum possesses a high coefficient of expansion, some rather complicated piston designs have been necessary to produce a casting which would possess an expansion comparable to that of plain cast iron. By producing an aluminum alloy which expanded at about the same rate as this high expansion cast iron alloy, a combination was developed which would operate together successfully when heated.* A number of engines developed along these lines in an experimental way have performed successfully and indicate the possibilities for the trend of engine manufacture in this direction.

The large amount of nickel and chromium which are present in the cast iron composition would indicate immediately that it is suitable for service at elevated temperatures. The resistance to oxidation of the ordinary composition is quite marked at temperatures in the range of 12-1500 deg. Fahr., and may reach a value of 10 to 12 times more resistant to oxide formation than plain cast iron in an oxidizing atmosphere. As the temperature increases, this degree of improvement diminishes until, in the range of 1600-1700 deg. Fahr., the difference is reduced.

A most important asset along with the resistance to oxidation is the fact that the iron is comparatively free from growth. Since the alloyed iron is austenitic in its character, and does not go through a transformation on heating and cooling with the accompanying dimensional changes, it is not so susceptible to growth as plain cast iron. Fig. 2 illustrates the difference in growth resistance between a plain cast iron and an alloyed iron of this type in an atmosphere of carbon dioxide. Further importance is attached to the fact that the resistance to growth prevails in either oxidizing or reducing gases of which carbon monoxide, carbon dioxide, steam, and muffle gases, are examples.

This resistance to growth and corrosion combined with the gray-iron nature of the material, may be utilized in corrosion-resisting service and to obtain freedom from sticking, in metal-to-metal contacts.



Section of Timken axle showing the double-reduction unit

Double Reduction Driving Unit Interchangeable With Worm Drives

A SERIES of double-reduction drive units has been worked out by the Timken-Detroit Axle Co., which can be substituted in standard Timken axles for the corresponding worm-drive units, either at the factory, by the dealer or in the field. Substitution of the double-reduction for the worm-drive unit is accomplished by merely removing the studs holding down the rear axle cover which contains the worm and substituting the corresponding double-reduction drive assembly. The only other change required is that of propeller shaft length.

The new double-reduction units have been worked out so that they require but very slight additional clearance over the center of the axle, distances between axle shaft and pinion shaft centers being close to the corresponding centers in the worm-drive axle assembly.

The interchangeable mounting of the units places no restrictions on the design of the wheels or brakes, of course. In either case the unit is completely inclosed. The major value to motor vehicle manufacturers, of course, is that they are enabled to offer an optional final drive.

The primary gear reduction in the double-reduction unit is obtained by a spiral bevel pinion and ring gear. The bevel ring gear is mounted on the same cross-shaft as the spur gear pinion, which serves as one-half of the second reduction, meshing with the larger spur gear mounted on the differential case.

The spur drive pinion (second reduction) is integral with the cross-shaft, while the spiral bevel ring gear is splined to it with a press fit. The cross-shaft is mounted in the case on Timken taper roller bearings, adjustable endwise by shims.

The first reduction pinion is also integral with its shaft and is mounted in opposed Timken taper roller bearings, adjustment being through the threading of the outer end of the pinion cage into the differential carrier.

Differential units, etc., are identical with the corresponding units of the worm drive. The offering of these double-reduction units was made possible by the acquisition some time ago by Timken of the Wisconsin Axle Co., who manufacture the units for Timken-Detroit.

Axle End Facilitates Removal of Wheel

W. A. BOGGS, general service manager of the Erwin M. Jennings Co., Bridgeport, Conn., has patented a design of axle end for automobiles which facilitates removal of the wheel from the axle shaft. The seat for the wheel hub on the shaft end is grooved circumferentially so as to reduce the bearing area of the hub, which is said to make freezing of the hub less likely. A longitudinal slot also is cut in the seat for the wheel hub, which makes it possible for kerosene or other penetrating oil to quickly reach the whole of the bearing surface and cut any rust that may have formed. The Erwin M. Jennings Co. is marketing axle shafts with this form of hub seat as replacement parts and we understand that several automobile manufacturers are using the shafts experimentally.

New Carburetor is Designed for All Automotive Needs Except Aircraft

For maximum power and quick acceleration, a special jet delivers fuel which merges with that from the main jet

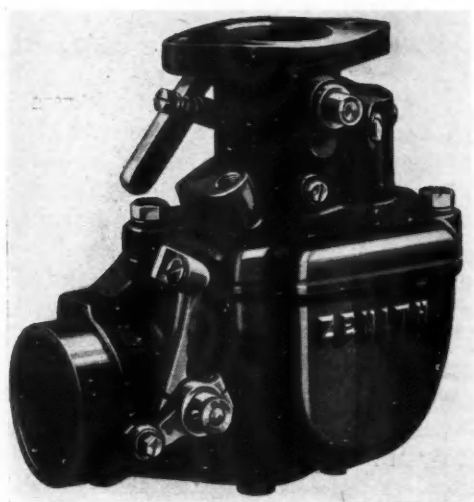


Fig. 1 (Above)—Zenith Universal carburetor +

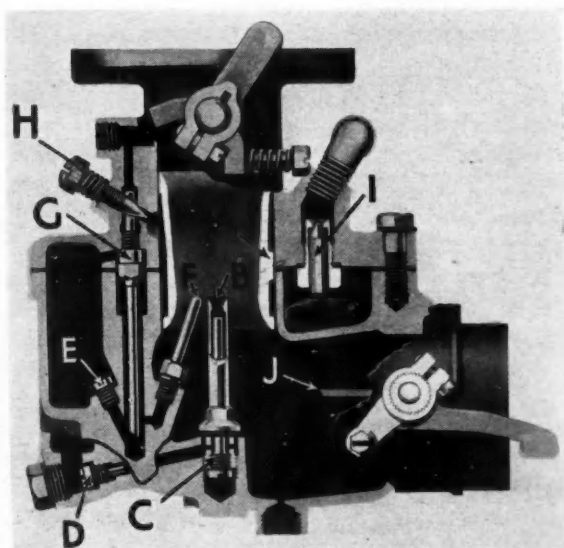


Fig. 2 (Center) — Section through axis of carburetor barrel and air inlet + + + +

A, venturi tube; B, discharge tube; C, power and accelerating jet; D, main jet; E, compensator; F, supplemental jet; G, idling jet; H, idling needle valve; J, strangler valve; K, throttle; L, economizer valve; M, check valve; N, power and accelerating piston

ZENITH-DETROIT CORP. has developed a new type of carburetor for all classes of automotive vehicles with the exception of aircraft, to which the designation "Universal" has been applied. Heretofore different designs of carburetor have been used on passenger cars and commercial vehicles. The passenger-car type, because the demand for it arose first and because production of passenger cars always has greatly exceeded that of other types of automotive machines, has generally been regarded as the standard from which other types were developed. In truck work it was found that the carburetors had to be of more robust design because they are subjected to much greater vibration, trucks operate much more nearly continuously all day long, and the governor connection to the throttle keeps the throttle shaft in almost continuous motion, so the wear on the bearing is much greater than in a carburetor not subjected to governor control. Truck carburetors, moreover, are more exposed to dust and dirt, and because of the severity and the commercial nature

of the work, quick response to the throttle and high fuel economy are even more important than in passenger car service. A study of these service conditions led the Zenith-Detroit Corp. to the

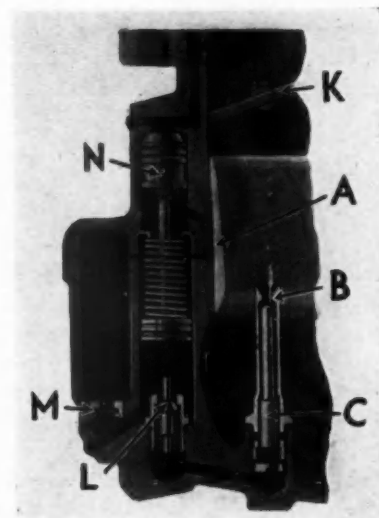


Fig. 3 (Right)—Economizer valve and piston

conclusion that while a carburetor specially designed for passenger car service is hardly suitable for truck work, a carburetor specially designed to meet truck conditions will make a better carburetor for passenger car service.

Referring to the sectional view herewith, the Zenith Universal model employs the same principle of mixture-strength control that has always characterized this make. There is a main metering orifice from which gasoline is drawn by the suction in the air tube, which, when functioning alone, increases the richness of the mixture as the suction (and therefore the rate of air flow through the carburetor) increases. In addition, there is a so-called compensating jet, through which gasoline from the float chamber flows under the influence of a constant head, into a well from which it is drawn by suction into the air stream, passing up the venturi.

The Two Jets Supply an Unvarying Mixture

The compensating jet delivers gasoline at a constant rate with respect to time, and therefore by itself would produce a mixture which would become leaner as the rate of air flow increased. Together the two jets produce a mixture that is substantially constant throughout the operating range. The main jet is more effective at higher, the compensating jet at lower speeds. Both jets are so proportioned in relation to the size of the venturi throat as to give a lean and economical mixture.

For starting and idling, mixture enters the carburetor barrel at the edge of the throttle disk. When the throttle valve is practically closed and there is therefore very little suction on the main jet and the supplemental jet, gasoline from the well into which the compensating orifice discharges is drawn up a tube rising parallel to the carburetor barrel. Air for the idling mixture enters through a hole in the wall of the carburetor barrel from the space surrounding the inserted venturi tube, which is controlled by a needle valve. By means of this needle valve the idling mixture can be adjusted for richness; the idling speed is adjusted by means of a stop on the throttle lever.

For maximum power under any conditions, and

especially for rapid acceleration, a richer mixture is required than that giving maximum fuel economy. The additional fuel required is provided in the Zenith Universal by means of an accelerating-and-economized system feeding through the power-and-accelerating jet, whose fuel stream merges with that of the main jet at the top of the discharge tube. The power-and-accelerating jet functions only when the throttle is fully open. When the latter is partly closed there is a considerable vacuum above the throttle disk. This draws the economizer piston upward, thereby causing the check valve to open and the economizer valve to close, which latter action shuts off the power-and-economizer jet from its source of fuel.

When the throttle is opened rapidly the suction above it drops, with the result that the piston drops in its cylinder, thereby building up a pressure below it. This pressure closes the check valve, thus preventing fuel from being forced back into the float chamber. The piston falls on the economizer valve, forcing it open, and the fuel displaced by the downward motion of the piston is forced through the power jet. This is the accelerating charge.

If the throttle is kept open, the piston will remain at the bottom, holding the economizer valve open. Fuel then continues to flow through the power-and-accelerating jet, which latter has a metering orifice in its top, of such size that it allows only enough fuel to pass through it to give full power. When the throttle is partly closed the vacuum above it increases and the economizer piston is drawn up to the top, closing the economizer valve and allowing only a lean and economical mixture to get into the engine.

The system is so arranged that it can be used with a governor. Referring to Fig. 4, a suction channel is drilled straight down through the flange. A short drill hole near the top connects this suction channel with

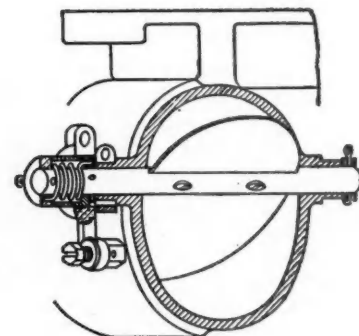
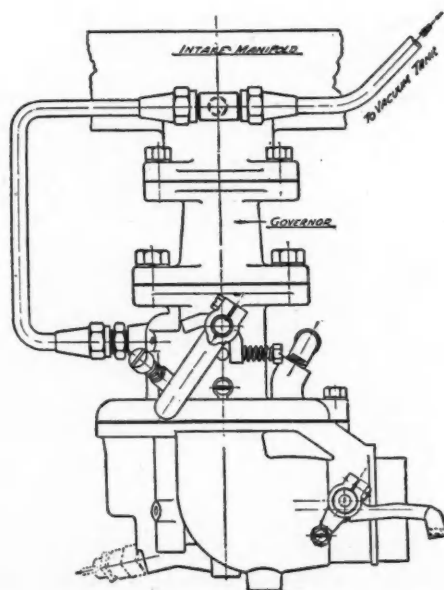
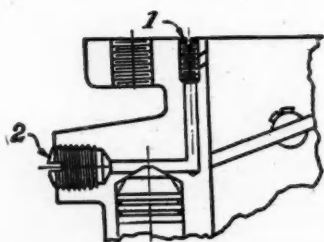


Fig. 4 (Left)—Suction passage to cylinder of economizer piston

Fig. 5 (Center)—Tubular connection from economizer when governor is used + + +

Fig. 6 (Above)—Spring-loaded strangler valve + + +

the inside of the carburetor barrel above the throttle. At the bottom this suction channel connects with a hole in a boss threaded for a $\frac{1}{8}$ -in. pipe plug. When no governor is used the screw at the top (1) is removed and a pipe plug (2) is put into the boss. Thus the space above the accelerator piston is placed in communication with the space in the carburetor barrel above the throttle through the suction channel. When a governor is used the carburetor throttle is kept wide open and the governor throttle regulates the speed. In that case it is therefore necessary to use the suction above the governor throttle for operating the accelerator piston. Screw 1 is then put in place to shut off communication with the space above the carburetor throttle and a tube connection is made from the threaded boss to a point above the governor throttle.

For starting, the throttle is just "cracked" open, which assures a high vacuum above it, and consequent strong suction on the idling jet, the tube of which is then submerged in gasoline in the well supplied by the compensator orifice. In place of the ordinary choke valve, with which it is often difficult to keep the engine running after the first few explosions, the Zenith Universal has a spring-loaded "strangler." This

is a butterfly valve with its shaft eccentric to the disk, so that the suction tends to pull the valve open. A fully inclosed coiled spring tends to keep the strangler closed, but the force of suction on the disk predominates at all but cranking speeds. Consequently, the strangler opens and closes as the speed of the engine varies.

The tension of the spring can be readily adjusted for different seasons. With this strangler, overchoking and consequent crankcase dilution are said to be prevented, and the need for jiggling of the choke in order to keep the engine running, eliminated.

The float chamber of the Zenith Universal is not vented to the atmosphere directly, but communicates with the air intake, hence, if an air cleaner is fitted to the carburetor, the drop in air pressure occasioned thereby (especially when the cleaner becomes choked with dust and dirt) does not affect the richness of the mixture delivered by the carburetor. Tilting of the carburetor to a considerable angle, either in the direction of travel or transverse thereto, has no effect on the fuel level in the float chamber and therefore cannot cause flooding, since the float chamber closely hugs the carburetor barrel.

Tests Establish Seizing Temperature of Lubricants

TESTS to determine the seizing temperature of oil as affected by journal speed have been conducted for some time at the National Physical Laboratory in England. The oil is fed into the bearing on the unloaded side, at a constant rate, the excess oil escaping at the ends. With this oil bath lubrication under a load of 2000 lb. per sq. in. the seizing temperature decreased continually as the speed of rotation was reduced, the rate of reduction becoming more rapid at low speeds. Within the speed range of 30-1300 r.p.m. there was no indication of a sudden change at a critical speed. These experiments are being continued, according to the Annual Report of the Laboratory for 1929.

The addition of tetra-ethyl lead had different effects on different lubricating oils. A well-known brand of cylinder oil was distinctly improved, but with castor oil the addition of the dope reduced the seizing temperature from 203 to 107 deg. C. In the case of a straight mineral oil supplied to the Air Ministry the minimum friction coefficient was lowered by the addition, but the seizing temperature was not affected. The two oils used in compounding this oil were then tried separately. The more expensive constituent, Pennsylvania stock, proved very constant as to seizing temperature and minimum friction after addition of the dope, and was unaffected by prolonged exposure to an oxidizing air blast while running during which the seizing temperature varied between 130 and 145 deg. C. The cheaper constituent, Russian oil, gave a lower minimum resistance (0.0009 against

0.00125) after 35 hr. of hot air blast run, while the seizing temperature rose from 73 to 135 deg. C. After that the friction remained constant while the seizing temperature fluctuated.

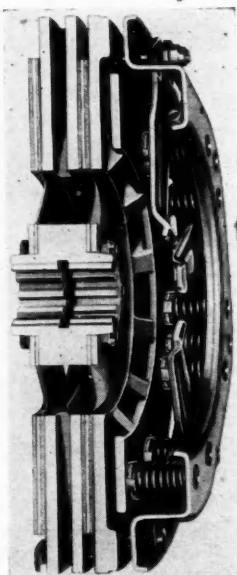
The same effect was observed when the hot air blast was applied before the run in the bearing; that is to say, this previous treatment reduced the initial period during which the friction decreased and the seizing temperature rose by 35 hr. The addition of tetra-ethyl lead without previous heat treatment had the same effect and did not further improve the heat-treated oil. The above-mentioned marked improvement in cylinder oil was not observed in any other case, and may be connected with the presence of some bitumen-base oil.

A WESTERN concern operating a chain of brake service stations is said to have found the use of a small acetylene torch supplied from a 100 cu. ft. acetylene cylinder handy in burning grease from brake bands. The cylinder is carried on a small two-wheeled truck, and is provided with a regulator to control the flow of gas, a short length of hose, and a small torch of the type used by telephone linemen in their work. In cleaning a brake band of oil or grease, the band is held in the vise and is gone over with the torch from all angles. The torch is said to have been found useful also in loosening frozen brakes.

NEW DEVELOPMENTS—AUTOMOTIVE

New Long Clutch for Trucks

A NEW clutch specially designed for heavy-duty work in services where it must be frequently engaged and disengaged, and where a large amount of heat is generated in consequence, has been announced by the Long Manufacturing Co., Detroit, Mich.



It is of the double-disk type and has a maximum torque capacity of about 500 lb.-ft. The disks are 13 $\frac{3}{4}$ in. in diameter and have a frictional contact area of 429 sq. in. The cast iron driving plates are unusually heavy, and thus have a great heat-storing capacity, and they have cored passages through them to facilitate air circulation and heat dissipation. The clutch takes its drive from the flywheel through six pins which also serve as mounting members for the clutch. To protect them from frictional heat and thus prevent drawing of their

temper, the clutch springs are heat-insulated.

This model fits a field that was not previously covered by products of the company, and it is already being fitted on several models of large trucks and buses.

Bunting Lead Hammer

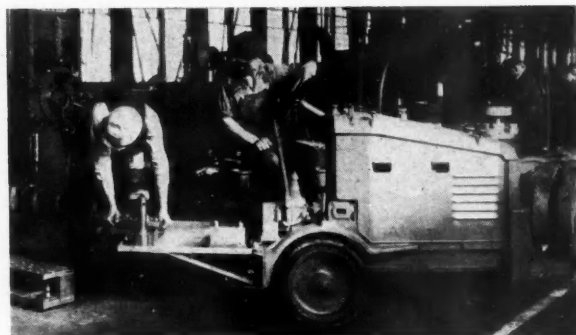
A LEAD hammer developed by The Bunting Brass & Bronze Company, Toledo, Ohio, is being introduced to the market. This new lead hammer is made in the 2 $\frac{1}{2}$ -lb. size and is securely assembled to a 10-in. steel handle. A more perfect balance and a superior metallurgical composition of the head are claimed for it.

This hammer supplements the line of copper-bronze hammers recently announced by the company.

Clark Stock Chaser

A N adaptation of the industrial tractor for maintenance work and deliveries has been introduced by the Clark Tractor Co., Battle Creek, Mich. It is proving valuable in taking tools, jigs and fixtures from tool room to machines, picking up special parts from storage, carrying mail, shop orders, job tickets, requisitions from one department to another. In larger plants Clark stock chasers run in regular time

schedules, stopping at designated stations for deliveries and pick-up. An important feature is the ease with which the rear platform may be



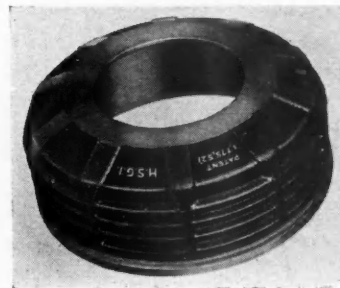
removed—a matter of two minutes. Thus the equipment is converted into a factory tractor with standard trailer coupler, capable of hauling 25 tons on trailers through narrow aisles and along crowded platforms.

The equipment consists of a sturdy, three-wheeled gas-propelled tractor equipped at the rear with a stout steel platform box 33 $\frac{1}{2}$ in. wide by 29 $\frac{1}{2}$ in. long with a load capacity of 500 lb. Turning radius 51 in.

Hunt-Spiller Develops Gun-Iron Brake Drum

HUNT-SPILLER MANUFACTURING CORP., Boston, Mass., a firm specializing in air-furnace gun-iron castings, has placed in production a patented design of brake drum for motor vehicles. Two

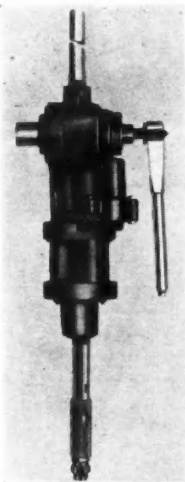
types of the drum are illustrated herewith. The ribs on the beveled portion strengthen the drum against distortion, and they may be continued across the cylindrical shell parallel to the braking surface. Both designs improve the heat-dissipation facilities of the drums, the ribs not only increasing the radiation surface but also helping to transfer heat from the surface at which it is generated to radiating surface at some distance therefrom.



PARTS, ACCESSORIES AND PRODUCTION TOOLS

If the ribs are carried across the cylindrical part they help to equalize the temperature across the width of the drum. It is also claimed for the design that it helps to prevent squeaking, as the frequent change in depth of section by the ribs tends to break up vibration.

Hercules Heavy-Duty Drill and Reamer



ADDITION of a pneumatic heavy-duty drill and reamer to the Hercules line is announced by the Buckeye Portable Tool Co., Dayton, Ohio. It is a powerful compact tool, and its light weight makes it well-fitted for close-quarter work. In addition to being a drill and reamer it can also be used for setting nuts and driving stay bolts.

This tool comes in two speeds—150 and 200 r.p.m. It is 9 in. overall, weighs 37 lb. and has a feed of $2\frac{1}{4}$ in. It is equipped with a Hercules twist throttle and No. 4 Morse taper socket.

New Toledo Compression Spring Testing and Selecting Gage

AN Automatic Compression Spring Testing and Selecting Auto Gage was recently announced by Toledo Precision Devices, Inc., subsidiary of the Toledo Scales Co., Toledo, Ohio.

This new gage will prove of great value to all manufacturers who seek uniformity in compression coil springs. As they pass through the auto gage each spring is compressed to a predetermined length, and the expansive force exerted by each spring thus placed under compression, is automatically indicated in pounds on a large dial. The springs are then discharged through a swinging chute, those of the proper stiffness dropping into one bin, those which are too stiff into another bin, and those not stiff enough into a third bin.

It may be set to compress and test springs of different lengths, and different degrees of stiffness, and to sort them within any desired tolerance.

The springs are dropped into sockets in a disk, which is intermittently rotated, carrying each spring beneath a plunger which descends and compresses the spring to a predetermined

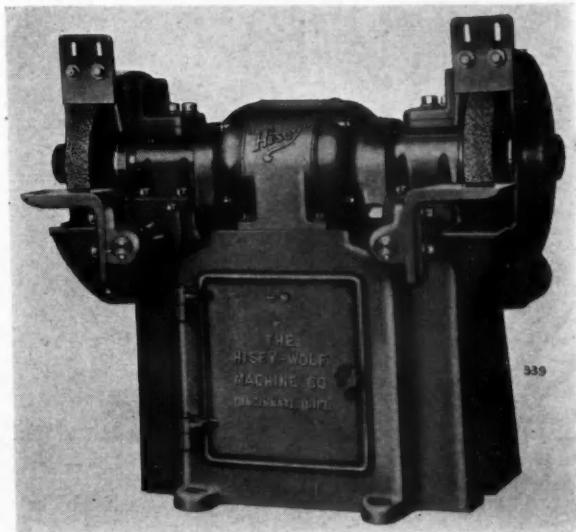
length. The pointer on the dial automatically indicates the force exerted by the spring when compressed, and the chute swings to position to discharge the spring into the proper bin. The manufacturers state that this gage can be set to select springs with a tolerance as low as four ounces.



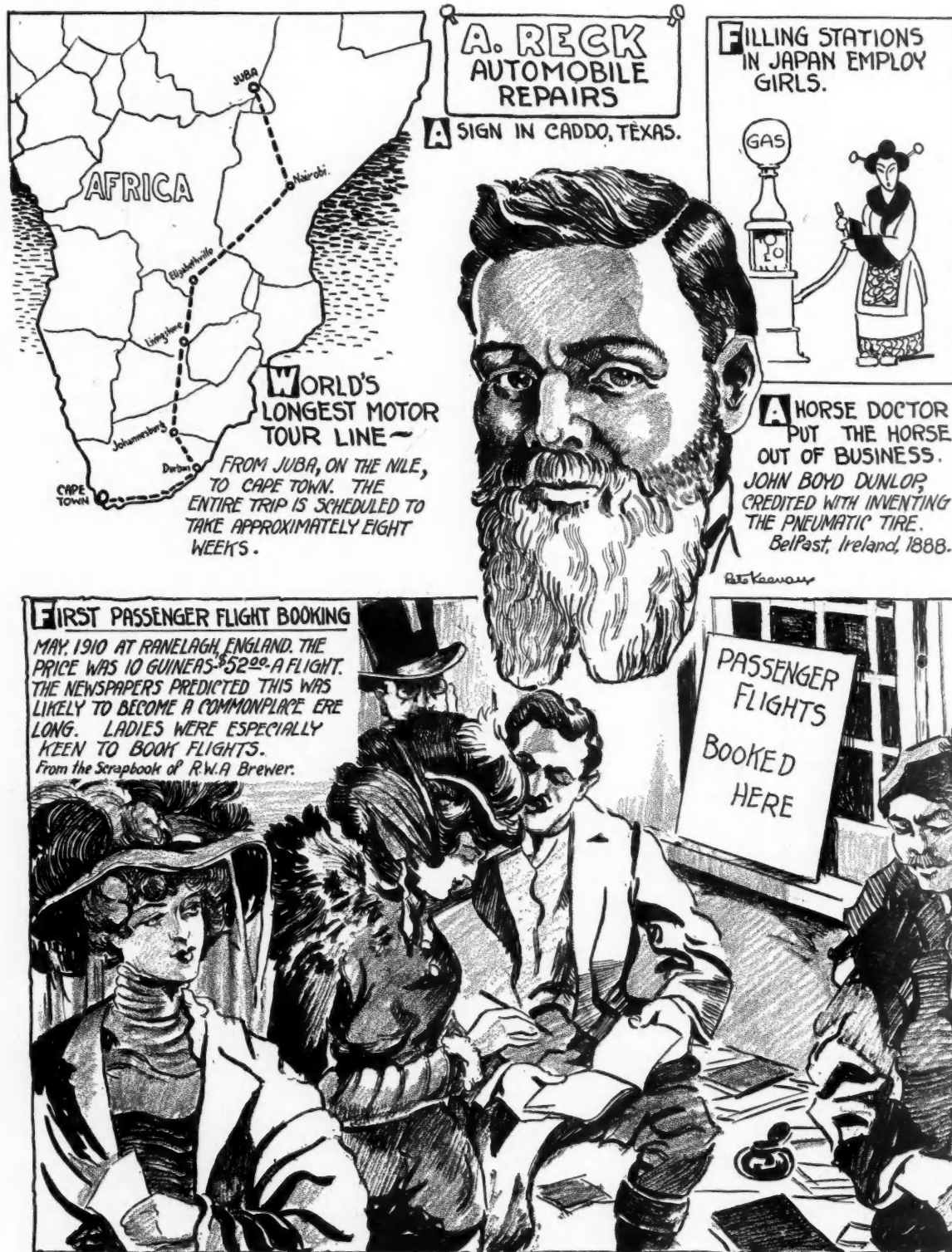
Hisey Improves Heavy Duty Stand Grinders

ACCORDING to a recent announcement, improved models of their 5, $7\frac{1}{2}$ and 10 hp. grinders have been placed on the market by the Hisey-Wolf Machine Co., Cincinnati, Ohio. Among the latest features are the following: Adjustable steel plate guards, larger spindle and bearings, and heavy, adjustable tool rests.

Wheels are 18 x 3, 20 x 4 and 24 x 4, respectively. Distance between wheel centers: 43, 44, 44 in., and net weight, 1650, 1800 and 2000 lb., respectively.



Automotive Oddities — By Pete Keenan





NEWS OF THE INDUSTRY

World Ambassadors Of Highways Meet

**Rousing Welcome Accorded
Road Congress Delegates
By Automotive Executives**

DETROIT, Oct. 28—A group of automotive executives, characterized as the most important of its kind to gather around one table in several years, met here last night to honor foreign delegates to the Sixth International Road Congress, who are assembled in Detroit after being separated into three road inspection tours.

The occasion was a banquet to welcome the visiting delegates, presided over by H. H. Rice, assistant to the president of the General Motors Corp. and a member of the Highway Education Board.

Mr. Rice introduced the delegates to the following executives, who sat at the head table: Edsel Ford, president of the Ford Motor Co.; Joseph O'Shaughnessy, president of the United States Rubber Co., and representing the Rubber Manufacturers' Association; George Willoughby, representing the American Petroleum Institute; J. E. Fields, vice-president, Chrysler Corp.; Robert Graham, vice-president, Graham-Paige Motors Corp.; W. J. McAneeny, president Hudson Motor Car Co.; Dubois Young, president, Hupp Motor Car Corp.; Alvan Macauley, president of the N.A.C.C. and Packard; Roy D. Chapin, president of the Sixth International Road Congress and of Hudson; Charles D. Hastings, chairman of the Board of Hupp; Don E. Ahrens, representing Lawrence P. Fisher, president of Cadillac; K. T. Keller, vice-president of Chrysler; A. W. Childs, chief of Automotive Division, Department of Commerce; Fred B. Sides, export manager of Hupp and chairman of the Detroit Committee formed to entertain the foreign delegates.

Others who sat at the table were: Grover C. Dillman, Michigan Highway Commissioner; Carlos Rabassa, highway engineer of Brazil; Dr. Erwin Nagle, vice-president of the German Road Association; Thomas H. McDonald, chief of the Bureau of Public Roads of the Department of Agriculture and chairman of the High-

(Turn to next page, please)

The News Trailer

By Herbert Hosking

NIAGARA FALLS, CANADA, Oct. 29—Reinforced by recruits from other tours, Tour No. 2 of the International Highway Congress is here to view the greatest perpetual cloudburst, beloved of honeymooners and barrel jumpers. . . . We are stopping on the Canadian side of the Falls, and toast and coffee has already assumed a new meaning. Both of them are something to drink over here.

This morning members of the tour stood with one leg in the United States and one in Canada, and both feet on the bottom of the Detroit River—this amazing contortion was accomplished during an inspection visit to the new international vehicular tunnel between Detroit and Canada, which will be opened in about another week.

As we left Detroit this morning some of us were wondering what Roy D. Chapin, Hudson's chairman, is going to do with the baby alligator named *Violet* which was presented to him as president of the International Highway Congress by Robert B. Bentley, chairman of Florida's highway department. . . . Mr. Chapin, at the time of presentation, grasped *Violet* behind the jaws with the adroitness of a Floridian and described to the dining delegates his reactions on gazing into *Violet's* eyes; it was good clean fun and hugely enjoyed by the delegates.

When *Violet* let out a squeak it was interpreted as meaning "on to Munich" for the next International Road Congress.

Hudson Reports Earnings

DETROIT, Oct. 29—Hudson Motor Car Co. has reported net earnings for nine months ended Sept. 30 of \$1,313,847 after depreciation and Federal taxes or 82 cents a share. This includes a loss for the third quarter of \$2,078,164.

Graham Plant to Resume

EVANSVILLE, IND., Oct. 28—The Graham-Paige Body Corp. factory, which has been closed since Oct. 15 for annual inventory, will resume production Nov. 3.

September Sales Show Tendency to Recovery

**182,000 for Month
Was 14% Decline as
Compared With August**

PHILADELPHIA, Oct. 29—Retail passenger car sales in the United States for September approximated 182,000, a drop of 42 per cent from the same month last year. The decline from August, however, was only 14 per cent, as compared with a normal seasonal downward movement between these two months of about 18 per cent. Consequently, if the figures are corrected for seasonal influences, sales showed a slight upward tendency in September.

Ford's percentage of total business in September was about 37.4, as compared with 38 per cent in August, 43.2 per cent in July, and 41 per cent in the first nine months of this year.

In the first three quarters of the year, total retail passenger car sales amounted to about 2,370,000 against 3,390,000 in the same period last year, a loss of 30 per cent.

Present indications are that 1930 retail sales will not exceed 2,850,000 materially which would be a decline of 29 per cent from the record 1929 total of 4,030,000. Compared with the average of the last five years (1926-1930 inc.) this estimate of 1930 sales represents a drop of 12 per cent.

Ford Expects to Build 30,000,000 Model A's

DETROIT, Oct. 28—In a recent letter to dealers, Edsel Ford, president of Ford Motor Co., predicted that 30,000,000 Model A Fords will be built before any major change in the car would be made.

The letter said in part: "You recall when the Model A was introduced three years ago we stated we would make more Model A cars than we had made of the Model T. We still intend to do that. In fact we look forward to the day when the 30,000,000th Model A will come off the line."

"We have the utmost confidence in the future of business, particularly of our own business and that of our dealers. We are in the midst of our greatest expansion program," he said.

World Road Delegation Assembles in Detroit

(Continued from page 665)

way Education Board which is sponsoring the tours; Major F. C. Cook, deputy engineer of the Ministry of Transport of Great Britain; Paul Le Gavrian, secretary general of the International Association of Road Congresses, Edward N. Hines, chairman of the Board of County Road Commissioners of the American Road Builders' Association, and Professor R. L. Morrison, professor of Highway Engineering, University of Michigan.

Addresses of welcome to the visiting delegates were made by Messrs. Chapin, Macauley, and MacDonald and responses on behalf of each of the three highway inspection tours were delivered by Major Cook, Dr. Nagel, and Senor Rabassa. Monsieur Le Gavrian spoke in the name of the whole visiting delegation.

The delegates were cited as "ambassadors of good roads and good will" by Mr. Macauley and exhorted to continue building "highways of friendship" by Mr. Chapin. The dinner closed with an enthusiastic cry of "on to Munich" for the seventh International Road Congress to be held in 1934.

While in Detroit the visiting delegates are the guests of ten automobile companies, and have visited or will visit representative activities of each of the companies. The companies contributing to the entertainment fund were listed in the official programs as: Cadillac, Chrysler, Dodge, Federal Truck, Ford Motors, General Motors, Hudson, Hupp, Graham-Paige, and Packard. After inspecting the International Vehicle tunnel between Detroit and Canada, the delegates will leave Wednesday for Niagara Falls and New York, where the highway inspection tours will be officially ended. Each of the touring groups has made about 7000 miles.

Tyson Bearing In Production

MASSILLON, OHIO, Oct. 28—The new plant of the Tyson Roller Bearing Co. here is getting into production. The company is a new concern in the field of bearing production although it is the result of years of engineering work.

End of Compulsory Insurance Seen

BOSTON, Oct. 27—Possibilities that the Massachusetts compulsory insurance law may be repealed by the next session of the legislature has been voiced in several quarters recently, particularly following an address by John W. Downs, general counsel for insurance companies in all the fights before legislative committees, when he advocated repeal of the law.

Financial Notes + + +

Caterpillar Tractor Co. has declared the usual dividend of 75 cents a share with an extra 25 cents. The payments are due Nov. 29 to stockholders of record Nov. 15. The company also released its statement for the first nine months of the year, showing net sales of \$37,319,910.38, compared with \$38,346,300 for the same period last year.

Sales of the gasoline engine division of the Briggs & Stratton Corp. for the nine months ending Sept. 30, 1930, constituted 41 per cent of the total business as compared with 33 per cent of the business in 1929. Net earnings for the third 1930 quarter amounted to \$199,621, equal to 67 cents a share on the 300,000 shares outstanding, as against \$441,241, or \$1.47 a share, in the three months ended Sept. 30, 1929. The net earnings of \$2.74 a share for the first nine months covered the annual dividend requirement of \$2 a share by a good margin.

Borg-Warner Corp. reports net income for the first nine months of 1930 of \$2,574,205, equivalent, after preferred dividends, to \$1.93 a share on 1,230,769 shares of common stock. Earnings of the company in the first six months of the year were \$2,375,371, leaving a balance of \$198,834 for the third quarter. Earnings for the quarter would be equivalent to approximately 11 cents a share on the common stock. Current assets as of Sept. 30 were \$17,192,229 and current liabilities were \$4,146,295.

Allis-Chalmers Manufacturing Co. for the three months ending Sept. 30, 1930, reports net income of \$682,982, after all charges and federal taxes, equal to 54 cents a share on the 1,258,400 shares outstanding. This compares with \$1,200,252, or 95 cents a share, in the third quarter of 1929, based on the present number of shares.

For the nine months ended Sept. 30, net profit amounted to \$3,034,523, equal to \$2.41 a share, as compared with \$3,379,340, or \$2.68 a share, computed on the present share basis in the corresponding period of 1929. Unfilled orders at the end of the third quarter of 1930 amounted to \$15,545,567, as compared with \$17,833,860 on June 30 and \$13,390,832 on Sept. 30, 1929.

Campbell, Wyant & Cannon Foundry Co. in the quarter ended Sept. 30 showed a net loss of \$32,815, after all charges, against a net profit of \$254,732, equal to 73 cents a share, earned on 348,000 shares of stock in the preceding quarter and \$177,052, or 51 cents a share, in the third quarter of 1929. For the nine months ended Sept. 30, net profit was \$550,681, after charges, depreciation and federal taxes, equal to \$1.58 a share earned, on 348,000 shares, against \$1,238,880, or \$3.56 a share, in the first nine months of 1929.

Bastian-Blessing Co. in 10 months ended Sept. 30 earned \$454,986, after charges but before Federal taxes. These figures are based on an estimated inventory which in the past has been substantiated by an actual inventory. No comparison with a like period of last year is available. The company in the fiscal year ended Nov. 30, 1930, reported a net income of \$689,325, after all charges, including Federal taxes, equal to \$5.99 a share on 115,000 shares of capital stock outstanding.

Monighan Manufacturing Co. for the nine months ended Sept. 30, 1930, reports a net profit of \$190,529, after all charges including Federal taxes, as compared with \$113,790 in the corresponding 1929 period.

Union Carbide & Carbon Corp. and subsidiaries report net profit for the nine months ended Sept. 30 of \$7,208,679. This compares with earnings of \$9,522,421 for the corresponding nine months of last year.

Eisemann Magneto Corp. has declared regular quarterly dividend of \$1.75, payable Nov. 1 to holders of record Oct. 23.

Waukesha Motor Co. will continue its present dividend rate of \$3 a share regularly and will probably pay an extra dividend of \$1 a share early in 1931, according to H. L. Horning, president. Directors believe industrial liquidation has been sufficient to warrant this action. Company has paid all of its bank loans, which on Aug. 1 amounted to \$370,000. Contingent liabilities have been reduced to a normal amount.

Briggs, Mfg. Co. has reported net profit for quarter ended Sept. 30, of \$1,001,723 after depreciation, Federal taxes, etc., equal to 50 cents a share on 2,003,225 shares no par stock against \$2,771,066 or \$1.38 a share in the preceding quarter and \$887,724 or 44 cents a share in the third quarter of 1929. For nine months ended Sept. 30, net profit was \$4,533,526, equal to \$2.26 a share, against \$3,310,421 or \$1.65 a share in the first nine months of 1929.

Packard Motor Car Co. has reported for quarter ended Sept. 30, net profit of \$1,153,771 after charges and taxes, equal to 8 cents a share on 15,000,000 shares of no par capital stock.

For nine months ended Sept. 30, net profit was \$6,680,193 after above charges, equal to 44 cents a share.

Perfect Circle earnings for the first three-quarters of 1930 totaled \$528,515 after all deductions were made for taxes and depreciation, or \$3.25 per share on the 162,500 shares of common stock outstanding. This compares with \$761,089 or \$4.68 per share for the same period of 1929.

Total sales for the first nine months, although off to some extent over the same period of last year, show signs of a partial recovery during the remaining last quarter of the year. Sales to car manufacturers for original equipment show somewhat of a decline, due to the curtailed production of new cars, but replacement piston ring sales through jobbers have broken all existing records for the period.

McCord Radiator Corp. took no action on the dividend on Class B stock. President McCord stated that despite the depressed condition of the industry, earnings for nine months were in excess of \$100,000, but directors considered it advisable for the company to maintain its strong financial position with a ratio of current assets of approximately 8 to 1.

Chrysler Corp., as successor to the rights and obligations of the Maxwell Motor Corp., will redeem all the outstanding Series G, H, I and J first mortgage 5½ per cent serial bonds of the Maxwell Corp. on Dec. 22 at 102 and accrued interest.

Eaton Axle & Spring Co., including Wilcox-Rich Corp., reports net profit for the first nine months of 1930 of \$1,426,536, after all charges. Earnings for the September quarter were \$40,906 as compared with \$759,883 during the preceding quarter.

Bohn Aluminum & Brass Corp. reports net profit for nine months ended Sept. 30, of \$692,736, or \$1.96 a share, on common stock. This compares with \$2,474,906, or \$7.03 a share, for the corresponding period of last year. Profit for the September quarter was \$3,970, or one cent a share, as compared with \$693,327, or \$1.97 a share, last year.

Goodyear Tire & Rubber Co. has declared regular quarterly dividend of \$1.75 on first preferred, payable Jan. 1 to stockholders of record Dec. 1.

Murray Corp. of America and subsidiaries has reported net profit for nine months ended Sept. 30, of \$750,258 after depreciation, interest and Federal taxes, equivalent, after dividend requirements on 8 per cent preferred stock of J. W. Murray Mfg. Co., assumed by Murray Corp. of America, to 96 cents a share on 769,073 no par shares of common stock.

Net profit for quarter ended Sept. 30, 1930, was \$16,215 after above charges, or approximately two cents a share, comparing with \$438,850 or 56 cents a share on 769,173 shares in the preceding quarter.

Trico Products Corp. reports net profit for the first nine months of the current year of \$1,573,005 after all charges. This is equivalent to \$4.19 a share on outstanding stock and compares with earnings of \$1,813,984, or \$5.37 a share for the corresponding period of last year. For the September quarter net profit was \$414,224, or \$1.10 a share, as compared with \$564,557, or \$1.67 a share, for the corresponding quarter last year.

Men of the Industry and What They Are Doing

Matheson Quits Chrysler; Joins Graham-Paige Staff

C. W. Matheson, former official of the Oakland Motor Car Co. and more recently vice-president of De Soto and general sales manager for Dodge Brothers, has resigned from the Chrysler Motors general staff to join the Graham-Paige Motors Corp.

From 1906 to 1914, Mr. Matheson headed the Matheson Motor Car Co., with a plant at Wilkes-Barre, Pa., manufacturing large, high-grade cars priced around \$6,000.

Altree Resigns From Bosch Magneto Corp.

A. H. D. Altree, vice-president in charge of manufacturing sales of Bosch Magneto Corp., submitted his resignation today, effective Dec. 31, to retire from active business. Mr. Altree joined German-owned Bosch Magneto Co. in 1909. He has directed manufacturing sales with the present corporation since its formation in December, 1918.

Pneumatic Elects Pendock

Charles W. Pendock, president, Le Roi Co., Milwaukee, has been elected a director of the Independent Pneumatic Tool Co., Chicago. Le Roi manufactures gasoline engines used exclusively in Independent portable air compressors.

Messinger is Elected

C. M. Messinger, vice-president of the Chain Belt Co., Milwaukee, has been elected general manager of the company. H. S. Greene, formerly with the Barber-Greene Company of Aurora, Ill., succeeds him as general sales manager. Brinton Welser, formerly secretary, was elected director and vice-president. J. C. Merwin was re-elected as vice-president. A. R. Abelt was elected secretary and continues in charge of chain sales. W. H. Brandt, formerly assistant secretary, becomes assistant to the president.

F. J. Fisher Returns

NEW YORK, Oct. 28—F. J. Fisher has returned for his holidays via Europe and England, after a three-year stay in South America. He was attached to the regional staff of General Motors Export Corp. in charge of truck and bus development. On completion of his regional work, he was appointed assistant sales manager in charge of commercial car ac-

tivities at the Brazilian plant. Prior to going abroad, Mr. Fisher was general sales manager of the Standard Motor Truck Co.

Was Cadillac Head, Now Distributes Reo



R. H. Collins, whose appointment as Reo distributor in the Chicago area was announced last week in *Automotive Industries*. He was at one time president of Cadillac Motor Car Co. and served as general sales manager of Buick.

Heads Reo Division

Announcement has been made by Oakland Motor Car Co. of the appointment of H. M. Stephens as sales manager in charge of the western division. Until recently he was sales manager of the Cadillac Motor Car Co.

Two New Distributors Appointed by Hercules

CANTON, OHIO, Oct. 28—Hercules Motors Corp. has appointed Hedge & Mattheis Co. and Cyril J. Burke as new distributors for Hercules engines, power units and parts.

Lincoln Promotes Stewart

W. S. Stewart, formerly in charge of the Pacific Coast offices of Lincoln Electric Co., is district manager in charge of the Cleveland territory.

Rosenfeld is Distributor

Max L. Rosenfeld, veteran truck dealer, has been chosen president and general manager of the newly-formed Brockway-Pacific Co. here.

Macfee Resigns From N.S.P.A.

R. Macfee, secretary of the National Standard Parts Association, Detroit, has resigned, effective Dec. 1. He will become executive secretary of the Central Supply Association, an organization of manufacturers and jobbers of plumbing and heating equipment.

Ahrens Promoted by Cadillac

Don E. Ahrens has been appointed assistant general sales manager of Cadillac Motor Car Co. He goes to Cadillac with a successful record of 15 years in the retail car field. During the past three years he has been general manager of the branch in Philadelphia, one of Cadillac's largest retail operations.

Palmer Heads District

Complete charge of the Chicago branch of the Ohmer Fare Register Co. was assumed Oct. 1 by B. C. Palmer, special sales engineer for that firm since 1927, and long a prominent figure in the taxicab industry.

In addition to supervising the business offices there, and continuing in his capacity of general sales manager for the company's taximeters, cash registers and recording devices, he will direct Ohmer activities over a large surrounding territory of eight states.

Giefer is District Manager

F. M. Giefer, St. Paul, Minn., has been appointed sales manager in charge of material handling equipment in the Northwest district by the Saginaw Stamping & Tool Co., Saginaw, Mich.

To Talk at S.A.E. Meeting

Herbert Chase, of the *American Machinist*, will be the speaker at the New England Section, S.A.E., at Hotel Kenmore, Boston, on Wednesday evening, Nov. 5. His topic will be "American Gearsets for Passenger Cars."

Joins U. S. Rubber

B. E. Marean, first vice-president of the Electric Hose & Rubber Co. of Wilmington, Del., has joined the organization of the United States Rubber Co.

Groehn Resigns Hudson Post

Otto J. Groehn has resigned as manager of the Gratiot Avenue plant of the Hudson Motor Car Co.

Automotive Sheet Orders Brighten Steel Outlook

Old-Time Leadership is Felt Once More

NEW YORK, Oct. 30—The steel market wears a decidedly brighter face than it did a week ago. This is in part due to a moderate increase in the operating rate of finishing mills made possible by the receipt of a fair volume of specifications from body builders and parts makers.

Aside from the routine commitments of the two leading manufacturers of low-priced cars, automotive buying is made up of a steadily growing number of small lot orders.

A contributory cause to the market's better feeling is that something like the old-time leadership is beginning to make its influence felt in the direction of more orderly price conditions. The keynote of the talks by the industry's leaders at the American Iron and Steel Institute's meeting was that the first step toward the market's rehabilitation must be to elevate going quotations to actual prices rather than, as has been the case of late, to permit them to furnish merely a basis for price cutting.

It is well recognized in the steel market today that some of the price declines, especially those in sheets and strip-steel, resulted to some extent from production economies, while others were largely due to competitors sniping at one another's prices.

It is the latter practice which it is sought to eliminate by better market leadership. While some transactions have undoubtedly taken place in unfinished automobile sheets at below the commonly quoted 3.50 cents, Pittsburgh, basis, the market for that specialty can hardly be characterized as weaker than it had been.

Studebaker Reports Profits

SOUTH BEND, Oct. 28—Studebaker Corp. announces net profits for the quarter, after taxes, were \$643,689.81, and for the first nine months of the year \$3,211,006.90, as compared with \$2,699,480.01 for the third quarter, and \$13,883,358.77 for the first nine months last year.

After deducting dividends on Studebaker and Pierce-Arrow preferred stocks and minority stockholders' interest in Pierce-Arrow Class "A" stock, the balance of net profits applicable to Studebaker common stock for the quarter was \$395,881.68, or 20 cents per share, and \$2,418,333.85, or \$1.23 for the first nine months. Comparative profits last year were \$2,407,741.24 and \$13,035,833 respectively.

Move Plant to York

YORK, PA., Oct. 29—The windshield plant of the Martin-Parry Corp., Indianapolis, will be moved here.

Mooney Finds European Outlook is Brighter Than Was Generally Believed

NEW YORK, Oct. 29—James D. Mooney, vice-president of the General Motors Corp. in charge of overseas operations, returned yesterday from a three months' factory-inspection tour through Europe. He said that next year will bring considerable improvement in economic conditions.

European political disturbances are only superficial, he said, and soon will pass away. During his tour of inspection of the General Motors Corp. plants, Mr. Mooney visited England, France, Germany, Denmark, Poland and Russia. He inspected the plants in Luton, England, Copenhagen, Paris and Warsaw, and also the Opel plant in Russelsheim, Germany.

"I am greatly encouraged," Mr. Mooney said, "by the way our business in Europe is holding up, and I believe that next year will see a considerable improvement in economic conditions generally and sale of motor vehicles in particular."

"The volume of General Motors business in Europe this year, from our American, Canadian and English sources, will exceed \$60,000,000. This is quite a respectable volume of business, after all, and a lot of talk we hear about the prevailing economic depression is a little difficult to understand when we stop to consider that only three or four years ago we would have looked upon sales running to such a figure as a rather remarkable achievement. I think we are too much inclined these days to forget the laws of inertia which determine the slow, steady growth of our foreign trade, and to make snap comparisons instead with what happened in the abnormal boom year of 1928."

"The best evidence I can give you of our confidence in the stability of Europe is the fact that we have gone ahead with our expansion programs there, and that we intend to go ahead with them uninterruptedly," he said.

"When I was in Copenhagen in September I attended the opening cere-

monies of our new plant in that city—a plant which cost us \$2,000,000 and which is undoubtedly the most modern and best equipped of its type in the world. This plant was started later in 1929, and we have never hesitated for a moment to proceed with its completion. The world as a whole, including Europe as a most important part of it, is too hungry for automotive transportation to leave the least doubt as to the necessity for the steps we are taking to fill that need."

Another passenger was Charles T. Kettering, vice-president in charge of research of the General Motors Corp., who said that the United States was suffering from the word "too." He explained there was too much production in every line instead of development and research in new fields. Asked if he meant there were too many automobiles in America, Mr. Kettering replied in the affirmative.

Lincoln Competition Offers \$17,500 Prizes

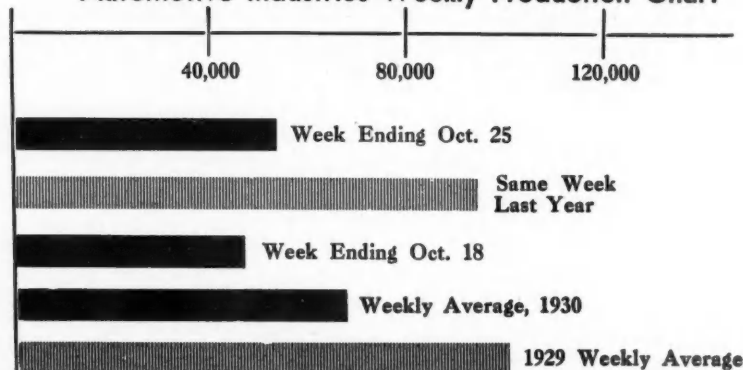
CLEVELAND, Oct. 29—Announcement of the Second Lincoln Arc-Welding Competition is made by the Lincoln Electric Co. In this competition designers and engineers of manufacturing concerns turning out products partly or wholly composed of iron and steel are offered a chance to show their skill and ingenuity in working out profitable applications of arc welding.

A sum of \$17,500 is being offered in rewards.

Pittsburgh Glass Buys Site

PORT HURON, ONT., Oct. 28—The Pittsburgh Plate Glass Co., Pittsburgh, it is reported, has purchased a property comprising approximately 325 acres on 1500 ft. of river frontage in Marysville, Ont. On the site selected, depending almost entirely on business conditions, this concern is expected to erect a plant for the manufacture of shatter-proof glass.

Automotive Industries Weekly Production Chart



Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

NEW YORK, Oct. 30—More seasonal weather last week favored several lines of retail trade. Greatly reduced stocks in the hands of wholesalers and jobbers resulted in brisker buying for immediate delivery. Factory production in September, according to the Federal Reserve Board, increased by about the usual seasonal amount. The commodity markets last week were marked by many price improvements.

LIFE INSURANCE SALES

Sales of ordinary life insurance during September were 10.9 per cent below those a year ago, while sales during the first nine months of this year were about the same as those in the corresponding period last year.

EXPORTS

Merchandise exports during September totaled \$318,000,000 as against \$437,163,000 a year ago, while imports amounted to \$227,000,000, as against \$351,304,000 a year ago. Total exports for the first nine months of this year amounted to \$2,958,509,000, as against \$3,843,676,000 a year ago, while imports amounted to \$2,401,838,000, as against \$3,360,017,000.

CRUDE OIL PRODUCTION

Average daily crude oil production for the week ended Oct. 18 amounted to 2,370,750 bbl., as against 2,366,800 bbl. for the preceding week and 2,903,200 bbl. a year ago.

COTTON

The number of cotton spinning spindles in place at the end of September was 33,959,172, of which 26,087,004 were operated at some time during the month, as against 25,873,978 in August and 30,035,470 a year ago.

CAR LOADINGS

Railway freight loadings for the week ended Oct. 11 totaled 954,874 cars, which marks a decrease of 224,666 cars below those a year ago and a decrease of 235,867 cars below those two years ago.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended Oct. 25 stood at 82.7, as against 82.7 the week before and 82.9 two weeks before.

BANK DEBITS

Bank debits to individual accounts outside of New York City for the week ended Oct. 22 were 23 per cent below those in the corresponding period last year.

STOCK MARKET

Despite the facts that there were periods of sharp downward reaction and that 472 stocks reached new lows for the year, the stock market last week enjoyed substantial recovery. The volume of trading was on a small scale, although the fluctuations in prices from day to day were wide. Most issues closed the week with net gains.

BROKERS' LOANS

Brokers' loans in New York City for the week ended Oct. 22 declined \$139,000,000, which, added to the declines in the three weeks preceding, makes a total decline of \$609,000,000 for the four weeks ended Oct. 22. The total of these loans on Oct. 22 was \$2,613,000,000, as against \$6,634,000,000 a year ago.

FEDERAL RESERVE STATEMENT

The consolidated statement of the Federal Reserve banks for the week ended Oct. 22 showed decreases of \$18,000,000 in holdings of discounted bills and of \$8,000,000 in holdings of bills bought in the open market. Holdings of Government securities increased \$1,000,000. The reserve ratio on Oct. 22 was 82.1 per cent, as against 80.9 per cent a week earlier and 81.6 per cent two weeks earlier.

1931 Chevrolet Models May be Discussed At Dealer Meetings, Starting November 3

DETROIT, Nov. 1—A significant sign of the aggressive policies to be adopted by the automobile industry toward making 1931 rank with past years in volume is seen here in the announcement that Chevrolet's annual dealer meetings are to get under way next week, two months in advance of the customary date. The first meeting will be in Cleveland on Nov. 3.

Four groups of sales officials from the home office, each group accompanied by a full carload of theatrical equipment, stage hands, electricians, etc., are scheduled to hold fifty meetings at as many central points during the next five weeks, which will be attended by upwards of 20,000 Chevrolet dealers and associated bankers located in every section of the country.

In previous years these meetings, which are held to acquaint the dealer organization with company plans for the new year, got under way in January, during New York Automobile Show week.

Inasmuch as formerly a portion of each meeting centered upon the pres-

entation of Chevrolet's annual new model, considerable speculation has been aroused here over a probable tie-up between the meetings and an early announcement of a new Chevrolet for 1931.

H. J. Klingler, vice-president and general sales manager, remained non-committal on the subject of a new car, other than to state that a part of the star chamber sessions with his dealers would be on this subject.

He explained the holding of the meetings earlier this year by stating that normally November and December are dull months in the industry, and dealers are better able to leave their places of business during these months than in January or February. He pointed out further that by holding the meetings now the dealers would have complete information on 1931 plans before the turn of the year, and would be able to put them into effect two months earlier than formerly, thus better preparing themselves for the usual early spring rush of retail business.

Thomas Adds Plant

SAN FRANCISCO, Oct. 28—K. D. Thomas, president of the Thomas Radiator Mfg. Co., has completed a trio of factories with the establishment of a branch here. The others are in Oakland and Fresno. His company serves the Fageol, Kleiber, Associated Oil, Standard Oil, Richfield Oil, California State Automobile Association and many other concerns. It has manufactured radiators for 15 years.

Durant Officials Upheld

OAKLAND, CALIF., Oct. 28—Superior Judge John D. Murphey has found for the defendants in the suit brought by W. A. Stewart against Norman de Vaux, president and general manager of the Durant Motor Co. of California, et al.

The suit grew out of the merger of the Durant company and the Star Motor Co. of California. Stewart asked that de Vaux and the other defendants be forced to pay into the treasury of the Durant company the money he claimed the Durant directors had voted to pay de Vaux in alleged excess of the actual value of the Star company.

Judge Murphey, declaring there was "not a scintilla of evidence showing wrongdoing on the part of the defendants," instructed the jury to bring in a verdict in their favor. He said that had he been a stockholder, he would have approved the action of the directors. The testimony showed that the companies were merged for the

best interest of both and that the Durant stockholders not only benefited greatly, but at three subsequent annual meetings approved the action of the directors.

Boosters Elect Officers

BOSTON, Oct. 27—Automotive Boosters Club, No. 1, of New England, held its annual election last week at which William T. Maybury was chosen president; Earl B. Harvey, vice-president, and Philip A. Gahm, secretary-treasurer. There was a large attendance of members and following the election James E. Redmond, returning president, was presented with a diamond studded Gothic B, the insignia of all past presidents. Mr. Redmond then gave a resume of business conditions as he found them in different parts of the country he visited on a recent trip. He said that business was improving. Mr. Maybury is head of his own company manufacturing chemicals in Boston; Mr. Harvey is representative for the Continental Rubber Co., and Mr. Gahm is New England representative for the Tumber products, Baltimore.

Ford Plant Under Way

RICHMOND, CALIF., Oct. 28—Erection of the structural steel work at the new Ford Motor Co. plant here is well under way. The entire works are to be completed next June. The factory will be 1000 ft. long and 400 ft. wide, partly of two-story design. It will have a capacity of 400 cars daily and will employ 2500 men.

Cadillac Executive Cites Wage Incentive Desire

Harry Ford Says Factory Worker Against Hour Rates

WASHINGTON, Oct. 28—During the past 10 or 15 years factory workers in general have developed a desire to work under incentive plans of payment rather than the hourly or day-rate method, according to Harry Ford, Cadillac Motor Car Co., Detroit.

Mr. Ford expressed this view in connection with an illustrated talk at a dinner meeting last Friday at the seventeenth national convention of the Society of Industrial Engineers. The session was given over to the "Present Status of Time Study and Wage Incentives" and Mr. Ford presented his subject "From the Standpoint of Factory Workers."

Probably the outstanding reason for the sentiment of factory workers in favor of the incentive plan was said by Mr. Ford to be that most such plans in use are fundamentally fair to the worker and are operated in a manner which tends to create a feeling of confidence in the minds of wage earners. The present favorable attitude of workers toward the wage incentive plan was compared with the opposition to it relatively few years ago.

British Organizer is Working in New Zealand

LONDON, Oct. 28 (*special*)—The interests of British motor manufacturers in New Zealand are now in the hands of A. W. Hawley, who was recently appointed organizer in the Dominion by the Society of Motor Manufacturers. Hawley knows New Zealand and its automobile requirements thoroughly. For ten years he was with Tozer, Kemsley & Millbourne, the Australian shippers, and for the last six years has been their manager in New Zealand.

He is familiar with the majority of British manufacturers and there is hardly a dealer or distributor in New Zealand he does not know intimately. His services are available to all members of the British section of the Society.

One of Hawley's tasks will be to secure a greater measure of cooperation among dealers in British cars, for in the past they have not been pulling together as well as they might. National advertising and propaganda, and "stunts" may fall under this heading; exhibition work will be more localized, and will be organized with the assistance of the provincial branches of the British (U.K.) Manufacturers' Association of New Zealand which have recently been formed at Auckland and Christchurch, in addition to the parent body in Wellington. Other branches will be formed in the larger towns, with sub-branches in country districts.

Hawley will keep in touch with Government departments and local authorities concerning their purchases of motor vehicles, and will keep a close eye on politics as far as they may affect tariffs and other matters of import to commerce. He will see that all cars going into New Zealand under British preferential tariff are 100 per cent British.

Dodge Shows House-to-House Delivery Truck

Pneumatic Control Unit Facilitates Starting and Stopping

CLEVELAND, Oct. 28—A pneumatic control which makes it possible for an operator to stop or start the vehicle by moving a single pedal is incorporated in a new house-to-house delivery truck exhibited by Dodge Brothers in the Dairy Industries exposition held in the Public Auditorium.

Two vacuum cylinders, one on clutch and the other actuating four-wheel hydraulic brakes, are controlled by the pedal.

To start the vehicle the operator presses on the pedal and operations of releasing brakes, engaging clutch and turning on the throttle ensue automatically.

To stop he releases the pedal, and the clutch is thrown out and brakes locked in position. Movements, such as these, between stops are made in low gear, which is engaged even when the vehicle is stopped.

For longer runs gears are shifted as in ordinary trucks except that a clutch control latch is attached to the gear shift lever to actuate the clutch cylinder without applying the brakes.

Approve Standards Change

NEW YORK, Oct. 27—The American Standards Association has approved revisions of nine national standard methods of test for petroleum products and lubricants, originally prepared and more recently revised by the American Society for Testing Materials.

These tests cover viscosity, water sediment content and cloud and pour points for petroleum products and lubricants; tests for distillation of gasoline, naphtha, kerosene and similar petroleum products; tests for the detection of free sulphur and corrosive sulphur compounds in gasoline, and tests for the determination of auto-geneous ignition temperatures.

Ban Use of Planes in Races

NEW YORK, Oct. 27—Curtiss-Wright Flying Service has banned the use of its commercial planes in airplane races. This move was taken as the result of the death last week of Richard W. Mackie, local operations manager, who was killed in Trenton in a race using one of the Curtiss-Wright Flying Service planes.

Bottom Reached In Trade Slump

Nash Tells Dealers He Expects Turn Soon

CHICAGO, Oct. 28—The bottom of the trade depression has been reached, Charles W. Nash, president of the Nash Motors Co., told members of the Chicago Automobile Trade Association last week.

He said the recently enacted tariff had reacted badly for general business. He stated he was not in favor of dealers having more cars forced on them than they could handle and declared that production schedules will probably be regulated by the law of supply and demand as the result of the lesson in cooperation brought out during the past year.

Mr. Nash sees no reason for mergers in the automotive industry growing out of the present situation, asserting that no company wants to absorb weaker companies.

Grass-Premier Has New Truck Models

MILWAUKEE, Oct. 28—The Grass-Premier Truck Co., Sauk City, Wis., manufacturer of motor trucks since 1923, has announced a complete new line of "G-P" trucks, ranging in size from 2 to 7 tons capacity in the four-wheel type and from 6 to 12 tons capacity in the six-wheel type.

Seven models are powered by Waukesha 6-cylinder engines and eight models by Lycoming straight eight engines. Horsepower ratings range from 85 to 140. The line will continue use of Timken worm drive and double reduction axles and Brown-Lipe transmissions.

All models are featuring 5 and 7 speed transmission, balloon tires, hydraulic air brakes, frames with deep center sections and wide springs. Auxiliary springs also are used. Radius rods and twin ignition are offered on all models except the 2 and 3-ton sizes.

Particular attention is being given to the appearance of the new trucks and this policy is being found of excellent value in merchandising the line.

Combined Show Programs Will Not Be Conflicting

CLEVELAND, Oct. 29—Meeting schedules for the convention sessions of the Motor & Equipment Association and the National Standard Parts Association have been arranged by officials of both associations in a manner that eliminates all important conflicts.

Both associations will hold their conventions separately in Cleveland during the week of their Joint Trade Show, Nov. 13 to 19, and the successful arrangement of the meeting schedules of each without conflict.

Holdings in Automotive Steel Co. Purchased

Pickands, Mather & Co.
Control Empire Concern

CLEVELAND, Oct. 28—The W. H. Davey holdings in the Empire Steel Corp. of Mansfield, Ohio, a \$23,000,000 concern, have been acquired by Pickands, Mather & Co. of this city.

The company has been manufacturing sheets for the automotive industry.

It was said that the new organization will develop and promote Empire Steel's properties in Mansfield, Niles, Ashtabula and Cleveland. The Pickands-Mather holdings place the local firm in a dominating position in the company's affairs.

Plan to Merchandise Bentleys in America

LONDON, Oct. 28—Captain Woolf Barnato, chairman of the Bentley Motor Co., has sailed for America to arrange for the organization of sales and service depots there and in Canada. This is part of a scheme to increase the export sales of Bentley cars in various parts of the world. A new French subsidiary company will shortly open a depot in Paris, and others are to be established in various British Dominions and elsewhere; arrangements in New Zealand have already been completed.

Bentley cars as sold in England consist of high-grade and high-efficiency overhead camshaft models; one is a Four of 4½ liters, another a Six of 6½ liters and a third (a new model) a Six of 8 liters.

The 6½-liter Six is produced in two forms, standard and speed models, the latter with a supercharger, the chassis prices being £1,700 and £1,800 respectively.

Use Molybdenum in Chains

CLEVELAND, Oct. 28—A new tire chain made of molybdenum steel has been announced by the Chain Products Co., manufacturers of Hodell tire chains. No change has been made in the shape of the cross links, but the alloy steel links are claimed to have better wearing qualities. The chains are made in a plant only recently completed.

Plans Speed Record Attempt

LONDON, Oct. 13 (*special*)—It is definitely announced that Captain Malcolm Campbell is having built for him a new car to attack the world's speed record at Daytona early next year. He will not, however, allow any information to be published concerning its construction, except that it is very low built, the highest point being only 40 in. above the ground.

It is also stated that Campbell will take with him to Daytona a party of prominent personalities in the British motor industry, who will have with

them examples of the light cars in which they are interested; these, after Campbell's record attempt, will be timed over the measured mile to demonstrate their speed capabilities.

Subsequently exhibitions may be arranged with the new racing car (to be known as Bluebird, like Campbell's earlier cars) as the center of the group. Possibly the party will proceed to Canada, New Zealand and elsewhere.

U. S. Production Reaches 222,931 in September

WASHINGTON, Oct. 28—The production of motor vehicles in the United States in September aggregated 222,931 units, a decline of only 117 under the August output of 223,048, according to the Department of Commerce. The passenger car output dropped to 180,547 from 187,037, while truck production rose to 41,975 from 35,760, and the taxicab output increased to 409 from 251.

The production of motor vehicles in Canada in September was 7957 units as against 9792 in August. The passenger car output was 5623 as compared with 6946 and the truck production was 2334 as against 2846.

British Road Traffic Census

LONDON, Oct. 14 (*special*)—The census of road traffic in Great Britain taken annually by the Automobile Association shows a smaller rate of increase than in any previous year. For the first time there is a reduction in volume at certain points.

The average number of vehicles passing A.A. census points in a week of 77 hours, from 1923 to 1930 inclusive, was as follows:

Average Number of Motor Vehicles Passing A. A. Census Points				
Year	Motor Cars	Motor-cycles	Heavy Motors	
1923	3,969	1,149	1,501	
1924	4,679	1,281	1,653	
1925	8,196	2,529	2,290	
1926	10,865	3,062	2,845	
1927	13,663	3,921	3,401	
1928	15,283	3,535	3,933	
1929	17,133	3,686	4,611	
1930	17,984	3,489	5,157	

Fisher Opens Plants

DETROIT, Oct. 27—Ten body plants of the Fisher Body Corp. resumed full-time operation today.

These plants are in Kansas City, St. Louis, Cleveland, Oakland, Calif., Buffalo, Tarrytown, N. Y., Flint, Atlanta, Janesville, Wis., and Norwood, Ohio. Between 6000 and 7000 men are employed in these factories and it was indicated that no new men will be employed.

R. A. Griffith Dies

NEW YORK, Oct. 27—Roy A. Griffith of Tulsa, Okla., president of the Sinclair Oil & Gas Co., died in New York last week from heart disease. He is survived by a widow; a son, Robert, 17 years old, and two brothers.

Austin Seven Averages 81.71 m.p.h. for 12 Hours

British Car Recoups
at Run at Brooklands

LONDON, Oct. 16 (*special*)—In the recent 500-mile race at Brooklands Track, organized by the British Racing Drivers' Club, a supercharged Austin Seven, driven by S. C. H. Davis and the Earl of March, won on handicap, averaging 83.41 m.p.h. Because it was pushed to start, the International Class H Records, which it broke, could not be claimed.

So yesterday at Brooklands the same car with Davis driving, assisted by C. Goodacre, was set to attack Class H records up to 12 hours. Thirteen records were beaten as follows:

	M.P.H.
50 Kilos	83.589
100 Kilos	84.566
200 Kilos	85.076
500 Kilos	83.82
1000 Kilos	82.80
50 Miles	84.35
100 Miles	84.94
200 Miles	82.98
500 Miles	83.72
1 Hour	84.83
3 Hours	83.45
6 Hours	83.73
12 Hours	81.71

During the last two hours the car was running in darkness, with the aid of a few red lamps hung at critical points of the track.

Davis is a member of the editorial staff of *The Autocar* (London), and has figured prominently in many road and track races in England and France. Goodacre is a youngster who on this occasion gained his first laurels in automobile speed work.

J. E. O'Keef Dies

MILWAUKEE, Oct. 20—John E. O'Keef, general manager of the Jesse A. Smith Auto Co., Milwaukee, distributor of the Hudson and Essex, died Oct. 14 at the age of 42 years. He had suffered from heart disease for nearly a year. Mr. O'Keef was three times chairman of the show committee of the Milwaukee Automotive Trades, Inc., and otherwise a leader in its activities. He joined the Smith company 15 years ago. His brother, Howard G. O'Keef, is wholesale sales manager of the company.

Plate-Lock Moves Plant

OSHAWA, ONT., Oct. 28—The Plate-Lock Battery Co., manufacturers of storage batteries, formerly of West Sutton, Ont., has moved its plant here.

Open Curtiss-Essex Port

NEW YORK, Oct. 27—Curtiss-Wright Flying Service opened and dedicated its Curtiss-Essex Airport at Caldwell, N. J., yesterday with a group of flying stunts in which Captain Frank M. Hawks and Lieutenant Alford J. Williams took the leading parts.

Monte Carlo Rally Set for January 21

Tenth Annual Automobile
Race Will Cover 1500 Miles

PARIS, Oct. 25 (*special*) — Monte Carlo will hold its tenth annual automobile rally on Jan. 21 of next year. This event, which was won by a Graham-Paige in 1929 with the same make of car second last year, is a long distance reliability contest in which the contestants have to maintain an average of 24.8 m.p.h., all stops included, with a minimum to qualify of 20 m.p.h.

In order to have a reasonable chance of winning, competitors must cover a distance of about 1500 miles and such a distance is not possible in Europe without crossing mountains or traveling over snow-bound regions.

On reaching Monte Carlo the competitors will be submitted to a brake and acceleration test, final awards being made on distance covered, average speed and points gained on formula in the braking and acceleration tests. Prizes total \$6,000.

Burgess Battery In Muffler Production

MADISON, WIS., Oct. 28 — The Burgess Battery Co. is getting into quantity production on exhaust and intake mufflers for gasoline engines, and several other products having to do with the acoustic field.

Renault Priced at \$1,920

PARIS, Oct. 25 (*special*) — Recent price reductions have brought the straight-eight Renault, Nervahuit model, to \$1,920, with four-door five-passenger sedan body. It is claimed here that this is a lower price than that of American cars in the United States of equivalent engine size and seating capacity. The Renault eight has an engine of 244 cu. in., is fitted with a four-speed transmission and has servo-operated brakes on the four wheels, and hydraulic shock absorbers.

Goodrich Promotes Morris

AKRON, Oct. 29 — E. T. Morris, advertising manager of the Pacific Goodrich Co., Los Angeles, was transferred to Akron to assist P. J. Kelly, advertising manager of the B. F. Goodrich Co. Guy Gundaker, Jr., was made sales promotion manager, a new position.

Admits Airplane Parts Free

All airplane parts and accessories from abroad will be admitted into China free of duty for a period of five years, according to the Department of Commerce.

+ + CALENDAR + + OF COMING EVENTS

SHOWS

National Roadbuilders' Show and Convention, St. Louis Jan. 10-16
International Garage Exposition, Berlin, Germany May 9-Aug. 9
New York, National Automobile Jan. 3-10
Chicago, National Automobile Jan. 24-31
Cleveland, Ohio, Automobile Jan. 24-31
Buffalo, N. Y., Automobile Jan. 10-17
Newark, N. J., Automobile Jan. 10-17
Milwaukee, Wis., Automobile Jan. 10-18
Detroit, Mich., Automobile Jan. 17-24
Syracuse, N. Y., Automobile Jan. 26-31
San Francisco, Calif., Automobile, Feb. 1-8
St. Louis, Mo., Automobile Feb. 2-7

CONVENTIONS

National Tire Dealers Asso., Chicago, Nov. 3-6
Regional Traffic and Aviation Conference (U. S. C. of C., Aeronautical C. of C., Chicago Asso. of Comm.), at Chicago Nov. 5-6
International Acetylene Association, Chicago Nov. 12-14
Motor and Equipment Association, Convention, Cleveland Nov. 13-19
N. S. P. A. Convention, Cleveland, Ohio, Nov. 13-19
Annual Asphalt Paving Conference, Memphis, Tenn. Dec. 1-5
First International Aerial Safety Congress, Paris, France Dec. 10-23
Society of Automotive Engineers, Annual Dinner, New York Jan. 8
Society of Automotive Engineers, Annual Meeting, Detroit Jan. 19-23
Society for Steel Treating (National Western Metal and Machinery Exposition), San Francisco Feb. 16-20

SALONS

Chicago, Drake Hotel Nov. 8-15
New York, Commodore Hotel, Nov. 30-Dec. 6
Paris, France, Salon (Commercial Vehicles) Nov. 13-23
Brussels, Belgium, Salon Dec. 6-17

Day Buys Out Nute In Ray Day Reorganization

DETROIT, Oct. 28 — Ray E. Day, president of Ray Day Piston Corp., Detroit, purchased the interests of his former partner, A. P. Nute.

The newly incorporated concern is a closed corporation, with a capitalization of 50,000 shares of common stock, and has taken over the former Ray Day Piston Co. Mr. Day continues as president of the new corporation.

There has been no change in Ray Day Pistons, Inc., of Seattle, of which Mr. Day is also president. This company serves the Pacific Coast States.

Ford Airlines Pass 10 Million Lb. Mark

DETROIT, Oct. 25 — The 10,000,000th lb. of freight to be carried by the Ford airlines left Ford Airport, Dearborn, Thursday morning, Oct. 23, when three trimotor Ford planes took off on regular airline schedules for Chicago, Cleveland and Buffalo, each plane carrying a "knocked-down" Ford car. The cars will be assembled upon arrival at the respective airports, immediately after the landing of the planes, by special crews of mechanics from the Ford branch plants.

Oshkosh Truck Concern Receiver Discharged

First Reorganization
Move is Completed

MILWAUKEE, Oct. 28 — An order has been entered in the circuit court at Oshkosh, Wis., approving the report of the receiver of the Oshkosh Motor Truck Mfg. Co., and discharging him from further duty. This is the first step toward the refinancing of the company by the bondholders' protective committee.

A new corporation is to be organized with a capitalization of \$200,000 of 7 per cent preferred stock and 60,000 shares of common of \$1 par value.

The committee considers the worth of the company as a going concern at upward of \$350,000. With the record of profits under the receivership and good prospects for future business, they believe the plant can be made a good, paying concern.

The principal product is four-wheeled drive trucks and a big market is seen in sales to municipalities.

Tire Shortage Is Predicted

AKRON, Oct. 26 — A shortage in automobile tires next spring is predicted by William O'Neil, president of the General Tire & Rubber Co. Declaring that there are now about 2,000,000 fewer tires in stock than there were a year ago at this time, Mr. O'Neil indicated that manufacturers' stocks of tires are at least 1,500,000 below last year, and there has been a shrinkage of more than 500,000 tires in dealers' stocks.

"American tire manufacturers will not have enough tires to deliver next spring to meet the demand," Mr. O'Neil declared.

Wisconsin Aluminum Foundry Reorganizes

MILWAUKEE, Oct. 28 — Wisconsin Aluminum Foundry, Manitowoc, Wis., a pioneer maker of aluminum castings, including crankcases and other automotive parts, has reincorporated its business as Wisconsin Aluminum Foundry Co., Inc., and increased its capitalization from \$125,000 to \$250,000. There is no change in ownership or management. Abe Schwartz is president; William Eck, secretary, and Edwin Pleuss, treasurer.

Van Epps Dies

MILWAUKEE, Oct. 27 — Frank L. Van Epps, Sr., president of the Free-land Steel Tank Co., Portage, Wis., died recently from a heart attack, after an illness of but two days. The company is a pioneer in the steel tank, gasoline and oil pump manufacturing business.